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IDENTIFIERS *Teaching Assistant Training Project; *University of Washington

ABSTRACT

Materials from a spring 1986 teaching assistant (TA) planning meeting held at the University of Washington are presented. The training meeting was sponsored by the Center for Instructional Development and Research (CIDR). Contents include: a list of workshops; a timeline for planning TA orientation activities; information on CIDR print materials, information on using videos to enhance instruction; booklets to facilitate the three videotapes (the graduate TA role, distinguished teachers on teaching, and encounters with teaching); a list of the types of instructional assistance available to TAs from the CIDR; a summary of the use of small groups for instructional purposes; consultation services provided by CIDR on student writing; a summary of the International Teaching Assistant Project; information on CIDR videotape facilities and services; a description of the small group instructional diagnosis (class interview) method of course evaluation; descriptions of selected research that is being undertaken by CIDR; and selected journal articles. (SW)

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Welcomes you to the

T.A. Training Planning Meeting

Tuesday, May 20

3:00 - 5:30

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Office of Educational Research and Improvement
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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

The materials in the Special Collection on the Training of Teaching Assistants were developed through the active efforts of numerous educators who first met at the 1986 National Conference on the Institutional Responsibilities and Responses in the Employment and Education of Teaching Assistants held at the Ohio State University. Assisted by more than 80 individuals, the committee chairs listed below were able to establish the collection which will be developed and maintained by the ERIC Clearinghouse for Higher Education. This arrangement will enable faculty members, faculty developers, administrators, TA supervisors, and graduate teaching assistants to have access to TA training materials produced by institutions across the nation.

Task Force on Establishing a National Clearinghouse of Materials Developed for TA Training

Chair: Jody Nyquist, University of Washington

Subcommittees

ERIC Collection Committee-	Chair: Margaret Pryately University of Oklahoma
Council of Graduate Deans Clearinghouse -	Chair: Sheila Caskey Southeast Missouri State University
Exploration of a Review Process -	Chair: Lynda Morton University of Missouri

ERIC Clearinghouse on Higher Education - Marilyn Shorr

Clearinghouse on ITA Materials - Janet Constantinides

CIDR TA Training Planning Meeting

May 20, 1986

Program

I. Welcome.....Jody Nyquist
Director for Instructional Development, CIDR

II. Opening Remarks.....Gene Woodruff
Dean, Graduate School

III. Panel: Needs of TAs at the University of Washington

Frederick Campbell, Sociology
Stanley Chernicoff, Geological Sciences
Anne Paul, Biology Program
Ted Paluchowski, Business Administration
Igor Vasilevsky, Chemistry

Moderator: Don Wulff, CIDR

IV. Workshops

A. TAs and Student Writing.....Room 131
Chris Farris, CIDR; Ed Delaney, Geography;
Jeff Peck, Germanics and Comparative Literature;
Jim Stone, Sociology.

B. Training International Teaching Assistants.....Room 225
Elizabeth Feetham, Assistant Dean, Graduate School
Ann Darling, CIDR; Tom Downey, CIDR;
Kristine Fitch, CIDR.

C. Planning a Fall Orientation Program.....Room 203
Donald Wulff, CIDR;
Lesley Olswang, Speech and Hearing Sciences.

D. Computers in Instruction.....Room 210
Lynn Churchill, CIDR.
Heidi Johnson, CIDR.

E. Working with Minority Students.....Room 223B
Gail Okawa, EOP Instructional Center
Emile Pitre, EOP Instructional Center.

V. Refreshments.....CIDR Conference Room 107

Center for Instructional Development and Research
Spring TA Training Planning Meeting Packet

Program

1) Letter from the Director for Instructional Development
2) Timeline for TA Training

CIDR TA TRAINING MATERIALS

PRINT MATERIALS:

3) Descriptions of and order forms for CIDR print materials
4) *Using Video to Enhance Instruction*

VIDEOTAPE MATERIALS:

5) Descriptions of and ordering information for CIDR videotapes

CIDR TA TRAINING SERVICES

6) Consultation services
7) Small Groups
8) CIDR Consultation on Student Writing
9) International Teaching Assistant Project Summary
10) CIDR Videotape Facilities and Services
11) Small Group Instructional Diagnosis (Class Interviews)
12) CIDR Brochure, ITA Brochure, List of CIDR Workshops

CIDR RESEARCH

13) Descriptions of CIDR Research Projects

SELECTED READINGS

14) "Preventing Burn-out in Teaching Assistants"
15) "Why TA Training Needs Instructional Innovation"
16) "Teachers and Learning Groups" Dissolution of the Atlas Complex"
17) "Responding to Student Writing"
18) "Computers in Education"
19) Selected Bibliography

Center for Instructional Development and Research
107 Parrington, DC-07
Seattle Washington 98195
(206)543-6588

University of Washington

May 20, 1986

Director for Program Research
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Director for Instructional Development
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Gerhard G. Mueller
Business Administration

Dear TA Faculty Coordinators and TA Representatives:

Welcome to CIDR's 1986 Spring TA Training Planning Meeting! We are delighted with the response this year and look forward to a productive afternoon together.

Since some of you hold new appointments in regard to TA training while others of you are long time friends of the Center and professionals at this job, we have attempted to provide a variety of basic TA training activities supplemented with some new sessions and an update of the training packet materials. We have surveyed many of you in preparation for today and hope this program will be responsive to your needs.

As you know, the training of graduate teaching assistants on this campus has been handled by individual departments. The University believes in discipline-specific training and, consequently, does not require all TAs to complete a general TA training program as do some universities. We continue to believe that this approach is to be preferred. This means, however, that we need each academic unit with TA appointments to provide significant, ongoing TA training programs. The importance of such training was reinforced in the recently published **UW 2000 Report** where both faculty and undergraduates recommended that we substantially strengthen the training of graduate teaching assistants for their teaching roles both at this institution and in preparation for their careers as university teachers.

As Provost Beckmann wrote your department chair last week, the Center for Instructional Development and Research has been asked to give TA training top priority from now through September. We are happy to do so and look forward to working with each of you during that time.

Meanwhile, we hope this afternoon's activities will support your TA planning efforts. We request that before you leave you will fill out the evaluation forms which will be distributed in the workshops at 5:00. We need that information in order that we may provide quality service to assist you in providing an effective TA training program for the fall of 1986.

Sincerely,

Jody D. Nyquist

Jody D. Nyquist
Director for Instructional Development

JDN/cg

Timeline for Planning TA Orientation Activities

The following outline is designed to assist departments in developing a timetable for planning TA orientation activities. For individuals wishing to discuss their plans for orientation in more detail, Center staff are available to assist in assessment of departmental needs and design of a program to meet those needs.

May

I. **Notify new graduate students of the: a) need for reliable summer addresses b) arrival of important mailings; c) requirements for TA orientation.** *(Often this process can be conducted in conjunction with other departmental mailings notifying new graduate students of their acceptance into graduate study.)*

II. **Assess departmental TA training needs and resources.** *(This process often includes using evaluations, mailings, and printed materials from previous orientations, talking to TAs and faculty about perceived needs, and reviewing programs developed by other departments).*

III. **Attend CIDR Spring TA Training Planning Meeting.** *(This meeting provides planners the opportunity to review available resources outside their departments, to assess their program in terms of campus-wide training efforts, and to begin scheduling services for fall training.)*

IV. **Develop an overall plan for TA Training.** *(Increasingly, individual departments are finding that their training needs are best met by ongoing programs of TA training that proceed throughout the academic year. If ongoing training is a departmental need, it is important to plan the program early in order to make the best use of resources. Many departments have found that a professional seminar on teaching is an important part of their ongoing training. For those interested in developing such programs, CIDR staff are available to assist with planning and development.)*

June

I. **Decide on tentative schedule of activities for fall orientation.** *(It is helpful to develop a tentative schedule before faculty and graduate students leave for the summer. The development of such a schedule commonly includes review of all resources--both within and outside the department--that can assist in meeting departmental TA orientation needs.)*

II. **Obtain permission from participants.** *(It is common to include both faculty and returning TAs in the orientation activities. It is best, however, if they are notified before they embark on other summer activites. When they agree to participate, it is important to inquire if they have any special room or equipment needs for their presentations. For greatest flexibility, it is also important to schedule CIDR staff as early as possible, especially if they will be providing training assistance during the summer.)*

III. **Check availability of rooms, equipment and resources.** *(Equipment and resources are resources are heavily scheduled at orientation time. For the best service, planners should schedule all resources well in advance, particularly those resources that are used across campus during orientation week, i.e., CIDR and the Instructional Media Services.)*

IV. **Obtain feedback about tentative schedule.** *(Because of the variety of schedules and needs of those involved in TA training, it is important to obtain feedback about the schedule of activities. Commonly departmental TA coordinators prepare tentative schedules and distribute them to faculty and continuing graduate teaching assistants for feedback).*

V. **Finalize the schedule.** *(Having the schedule finalized before participants leave for the summer ensures that all participants are aware of their responsibilities. Finalizing the schedule early also means confirmation of resources outside the department).*

July-August

I. **Notify new graduate students of their responsibilities during TA training.** *(This mailing should include a schedule of orientation activities. Commonly TAs are reminded that their pay begins on September 15 and they can, therefore, be required to attend departmental orientation activities anytime after that date. Some departments remind newcomers that they should arrive in plenty of time to find housing, establish bank accounts, etc., so they are free to focus on orientation during the scheduled times. Many departments also send out copies of reading materials such a textbooks and Mentor.)*

II. **Work with CIDR staff for any training assistance needed to facilitate workshops or videotapes for fall presentation.** *(CIDR staff encourage departments to use individualsin their own disciplines as resource persons for presentations during orientation. Since the activities frequently involve facilitation of videotapes produced at the Center or discussion of instructional issues, CIDR staff work with individuals to prepare tfor their responsibilities as resource persons in their own departments. It is best if CIDR staff can provide such assistance well in advance of the formal orientation.)*

III. **Confirm scheduled resources and facilities.** *(In late July or early August, CIDR staff will send a letter of confirmation to all departments that have scheduled CIDR services. It is a good idea to confirm all other resources and facilities as well.)*

IV. **Gather materials for packets.** *(Many departments prepare a packet of materials designed to orient new graduate students to the department and the university in general. Packets commonly include materials such as: departmental policies and guidelines; information on graduate teaching assignments; instructional resources; CIDR brochure; building, campus and university district maps; faculty profiles; Mentor ; counseling center information; style and policy manual for theses and dissertations; GPSS manual; and descriptions of other graduate student organizations and services. To avoid overload, many departments send out some of the reading during the summer.)*

September

I. **Send reminder notes to participants.** *(Before the formal activities, presenters should be reminded of times, places, and logistics for their participation.)*

II. **Conduct orientation activities.** *(Most departments conduct orientation during the week prior to the beginning of classes. Although the length of orientation varies, the average length is three-five days.)*

III. **Obtain closure.** *(Such closure consists of activities such as returning equipment and sending thank you notes to presenters.)*

IV. **Follow-up.** *(Follow-up may consist of a variety of training activities including: a one quarter, discipline-specific seminar on instruction; ongoing discipline-specific workshops on instructional issues; periodic videotaping of instruction; midterm evaluations for each quarter; classroom observations conducted by faculty supervisors or CIDR staff consultants.)*

Timetable for Planning Major TA Orientation Activities

May	June	July/August	September
• Assess departmental TA training needs	• Set tentative schedule	• Contact new graduate students	• Conduct fall orientation
• Attend CIDR Spring Meeting	• Contact participants	• Work with CIDR staff to develop TA training	• Prepare for ongoing TA training program
• Develop plan for TA training	• Schedule equipment, facilities	• Prepare packets	

This timetable is approximate and is designed to be used as a guide. The planning activities may actually overlap from month to month depending on the needs of individual departments.

CIDR PRINT MATERIALS

MENTOR: A HANDBOOK FOR NEW TEACHING ASSISTANTS

This handbook serves as an excellent general supplement to department TA orientation. It provides up-to-date information on university TA policies and procedures, instructional support services and campus contacts. MENTOR answers TA questions on effective lecturing, discussion and lab supervision techniques, course planning, evaluation and grading, as well as questions unique to new instructors ("What IS my status? "Am I the student's 'pal'? Who evaluates ME?"). In addition, MENTOR identifies where to get help with instructional skills.

MANAGE YOUR STUDENT RATINGS (TA EDITION) & NOW MAKE THE MOST OF YOUR STUDENT RATINGS

These two pamphlets are designed to help TAs plan for, interpret and then follow-up on their student ratings, as well as trust them. MANAGE YOUR STUDENT RATINGS addresses student ratings concerns particular to TAs, then suggests how TAs can plan for ratings from the time they begin planning syllabi. Suggestions include pre-evaluation, frequent yellow sheet type evaluation items for section V of EAC's mark-sense forms. NOW MAKE THE MOST OF YOUR STUDENT RATINGS details the validity and reliability of student ratings, then offers methods for instructors to interpret their ratings printouts and analyze their yellow sheets. It then suggests translations of these numeric and verbal data into needs/opportunities for changes in instructional strategies. In addition, it cites resources and resource persons for follow-up on the ratings.

REFERENCE MANUAL FOR TEACHING ASSISTANTS IN LIFE SCIENCE LABORATORIES

This manual offers suggestions on how to handle various teaching situations that are common to life science laboratories and provides a framework for use in many different life science lab applications. The topics discussed include the responsibilities of a laboratory TA, the educational objectives for life science laboratories, interacting with students and colleagues, preparing for and running a laboratory session, evaluating the performance of students and instructor, maintaining laboratory safety, working with biological material, caring for equipment, and designing laboratory exercises.

(Please cut along dotted line. Send in campus mail to CIDR, DC-07.)

NAME: _____ TITLE: _____ DEPT: _____ MAILSTOP: _____

MENTOR: A HANDBOOK FOR NEW TEACHING ASSISTANTS — Number of copies needed for new TAs: _____ — Date by which copies need to be sent: _____

MANAGE YOUR STUDENT RATINGS (TA EDITION) & NOW MAKE THE MOST OF YOUR STUDENT RATINGS — Number of copies needed for new TAs: _____ — Date by which copies need to be sent: _____

REFERENCE MANUAL FOR TEACHING ASSISTANTS IN LIFE SCIENCE LABORATORIES — Number of copies needed for new TAs: _____ — Date by which copies need to be sent: _____

USING VIDEO TO ENHANCE INSTRUCTION

Using Video to Enhance Instruction is a resource booklet designed to help instructors use videotape and videodisc technology as an aid to their classroom or tutorial teaching. The purpose of the booklet is threefold:

to identify the instructional goals video can help students achieve;

to describe specific procedures for using video; and

to identify campus resources available to instructors who wish to use video to enhance their teaching.

The bulk of the booklet is a description of the ways videotape and videodisc technology is used by instructors from a variety of disciplines to:

1. present course content (i.e. the use of video to project computer graphics in Sociology or the use of videodisc to present patient cases in Physiological Nursing),

2. teach professional skills (i.e. the use of videotaping in the Law School to teach advocacy skills or the use of videotaping in Social work to teach interviewing skills); and

3. improve teaching effectiveness (i.e. the showing of a professional tape on teaching for TAs in Geography or the use of video coaching to improve classroom teaching skills in English as a Second Language).

Teaching Assistants and TA trainers can use the booklet in a number of ways. The booklet, particularly the discussion of instructional goals and the examples of current uses of video, can be the basis of a structured discussion among instructors about the potential for using video in their teaching. The examples can also serve as models for particular instructors who may wish to adapt currently used video procedures to their own needs. Finally, the booklet can serve as an indication of the resources available should particular instructors or groups of instructors wish to explore further the potential for integrating video as a teaching tool within their courses.

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THE ROLE OF THE GRADUATE TEACHING ASSISTANT

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THE ROLE OF THE GRADUATE TEACHING ASSISTANT

A Videotape About TA Responsibilities

Center for Instructional Development & Research

THE ROLE OF THE GRADUATE TEACHING ASSISTANT

A Videotape about TA Responsibilities

"The Role of the Graduate Teaching Assistant" identifies and explores five of the many responsibilities of graduate students in their roles as Teaching Assistants at the University of Washington. TAs demonstrate effective performance of each of the responsibilities in a specific content area and discuss how they prepare for such responsibilities.

TA TEACHING RESPONSIBILITIES:

LECTURING This segment of the tape illustrates the importance of using a clear organizational format, providing relevant examples, and taking time to answer questions in ways that demonstrate how to think about problems in the field.

LEADING DISCUSSION This segment of the tape illustrates the importance of allowing time for student responses, extending student examples, and encouraging reasoned student judgment.

DIRECTING LAB This segment of the tape illustrates the importance of observing safety standards, allowing time for student questions, and encouraging student thinking.

GRADING This segment of the tape illustrates the importance of identifying grading criteria, providing useful examples, and allowing time for grading decisions.

TUTORING This segment of the tape illustrates the importance of probing students' thinking and providing a framework for students' future problem solving.

Uses For The Videotape

- workshops for faculty development or teaching assistant training
- classes focused on education or instructional methods
- meetings addressing teaching issues
- conferences focused on instruction such as local or national conventions

Videotape Format and Order Form

The videotape sells for $225 for 1/2-inch VHS or Beta and $250 for 3/4-inch, including shipping.

You may order by filling out the order form below and mailing it to the Center for Instructional Development and Research, DC-07, University of Washington, Seattle, WA 98195

There is no charge for use of the videotape by University of Washington instructors.

Send to: Bill to:

_____ _____

_____ _____

_____ _____

The Role of the Graduate Teaching Assistant

Format:	U Format 3/4"	$250
	VHS Format 1/2"	$225
	BETA Format 1/2"	$225

ABOUT THE CENTER FOR INSTRUCTIONAL DEVELOPMENT AND RESEARCH

Representing a part of the University's commitment to excellence in teaching, the Center for Instructional Development and Research (CIDR) provides a central facility to assist instructors, teaching assistants, and departments in the continued improvement of learning and teaching. The Center functions as a resource clearinghouse for instructional problems. It provides instructional consultation and access to educational materials, equipment, and services. In short, the Center provides comprehensive support for the teaching aspects of a scholar's life at the University of Washington.

The Directors, Staff Associates, and Research Assistants work together to provide services, to conduct projects on learning and teaching, and to publish materials on instructional improvement. From time to time, additional expertise is acquired by the appointment of visiting scholars who conduct instructional research and by Staff Associates hired to assist with particular projects. The academic staff at the center hold appointments in the Departments of Educational Psychology and Speech Communication and participate in teaching and research in those departments.

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ENCOUNTERS WITH TEACHING

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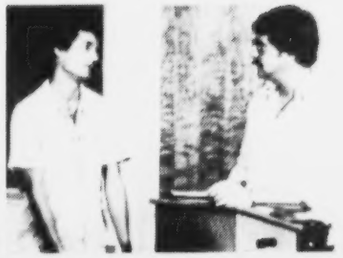
ENCOUNTERS WITH TEACHING

A Videotape About Managing TA-Student Encounters

Center for Instructional Development and Research
Produced by the Speech Communication Instructional Resources Center
and Instructional Media Services, University of Washington



ENCOUNTERS WITH TEACHING

A Videotape About Managing TA-Student Encounters

"Encounters With Teaching" presents examples of thirteen teacher-student interactions which both beginning and experienced instructors often find difficult to manage. Each teaching encounter is role-played sufficiently to establish the situation to which the instructor must respond. The narrator then asks the viewers a series of questions designed to probe the issues raised within the encounter. The tape is designed to encourage discussion which enables participants to develop a variety of appropriate responses to students. The format allows the user to select and respond to any number of episodes. A users guide providing a variety of discussion formats and additional resources accompanies the tape.

Goals of the Tape:

1) Identify types of interactions that may pose problems for beginning as well as experienced instructors.

2) Raise questions that will stimulate helpful discussion about these potentially difficult interpersonal encounters with students.

3) Encourage the development of thoughtful, effective ways to respond to students.

Teaching Incidents Portrayed:

Last quarter's grade
Office hours
A paper you've read before
Language problems
Speech topics
Minority issues
Resistance
Student critiques
Appropriate materials
Class discussion
Relations with students
Make-up grades
Group grades

Uses For The Videotape

- workshops for faculty development or teaching assistant training
- classes focused on education or instructional methods
- meetings addressing teaching issues
- conferences focused on instruction such as local or national conventions

Videotape Format and Order Form

The Videotape sells for $150 for 1/2-inch VHS, Beta or 3/4 inch, including shipping.

You may order by filling out the order form below and mailing it to either The Center for Instructional Development and Research, DC-07, University of Washington, Seattle, WA 98195, or Speech Communication Association, 5105 Backlick Road Suite E, Annandale, Virginia 22003.

There is no charge for use of the videotape by University of Washington instructors.

Send to | Bill to

_____ _____

_____ _____

_____ _____

Encounters With Teaching

Format:	U Format 3/4"	$150
	VHS Format 1/2"	$150
	Beta Format 1/2"	$150

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DISTINGUISHED TEACHERS ON TEACHING

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DISTINGUISHED TEACHERS ON TEACHING

A Videotape About Teaching

Center for Instructional Development & Research

DISTINGUISHED TEACHERS ON TEACHING
A Videotape About Teaching

"Distinguished Teachers On Teaching" presents three instructors who have received the University of Washington's Distinguished Teaching Award for excellence in teaching. The professors talk about their instruction , and students enrolled in these courses are asked to comment on their instructional experiences with the three professors.

Goals of the Tape:

1) Provide examples of three different instructional methods

2) Offer new ideas and methods for instruction which teachers can use in their own classes

3) Identify qualities of effective instruction from the student perspective

Instructional Methods:

Lecture The first instructor is Jaime Diaz teaching a lecture course to undergraduates in psychology. In this section Professor Diaz lectures, blending questions and answers into a conversational presentation.

Laboratory The second instructor is Leonie Piternick teaching undergraduates how to teach lab courses to elementary school students in Biology. Professor Piternick uses experimental instructional techniques and student teams to help students learn the basic principles of biology and the steps involved in scientific process.

Modeling The third instructor is Henry Maier teaching an advanced course about group process in social work. Professor Maier uses role playing and modeling techniques to demonstrate behaviors and principles that are crucial to leading therapy groups.

Uses For The Videotape

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107 Parrington, DC-07
Seattle, Washington 98195

FACILITATION OF CIDR VIDEOTAPES

A CIDR staff member will show any of the following videotapes in a group setting: "The Role of the Graduate Teaching Assistant"; "Distinguished Teachers on Teaching"; "Encounters With Teaching"; or "Demonstration of a Peer Writing Group". Following the viewing, the staff member will facilitate discussion designed to relate the issues raised in the videotape to the instructional needs and interests of the participants.

HOW TO SCHEDULE CIDR VIDEOTAPE VIEWING

Instructors are welcome to preview any of the videotapes at the CIDR facility, located in room 107 Parrington Hall. To schedule a preview or group viewing, simply call the Center at 543-6588.

Consultation Services

A great deal of time for CIDR staff is spent in consultation. When TAs call the Center for assistance, they are commonly referred to a consultant who specializes in the particular area of interest. For example, a TA may be concerned about his or her approach to lecturing or discussion or may want help interpreting a set of student ratings. Another TA may be interested in ways of obtaining student feedback or simply working to improve general teaching effectiveness. In any of these instances, the Center staff uses consultation to help the TA determine particular instructional needs and choose an appropriate form of assistance.

In some of these cases, the TA may simply need to discuss teaching informally with the consultant or be referred to other print or media resources. In other instances, the TA may choose further interaction with the consultant in the form of videotape critique or midterm evaluation of a course. Instructional assistance is available to TAs in a variety of areas including:

- *course planning and development*
- *teaching strategies*
- *large class instruction*
- *instructional uses of new technologies*
- *classroom presentation skills*
- *student-teacher interactions*
- *student learning styles*
- *student writing*
- *methods of evaluating teaching*
- *test construction and evaluation*
- *ongoing programs of faculty development*
- *TA training*
- *instructional resources and materials*
- *instructional research*

Consultation services are confidential and free for University of Washington TAs, and appointments are welcome on a one-time only or a continuing basis. To arrange a consultation on an instructional matter, contact the Center at 3-6588.

Center for Instructional Development and Research
107 Parrington Hall, DC-07,University of Washington
Seattle, WA 98195

SMALL GROUP INSTRUCTION

With the recent interest in active learning and critical thinking, instructors are seeking additional tools to involve students more actively in the teaching-learning process. The use of small groups is one instructional strategy that can be used to increase opportunities for students to think critically while they are actively engaged in learning. Because the use of small groups creates instructional opportunities that are not possible to obtain in any other way, CIDR has developed a workshop on the use of small groups as an instructional strategy. Such a workshop is especially appropriate for TAs who teach quiz sections or lab sessions where student interaction and involvement has the potential to increase both the cognitive and the emotional growth of the students.

The following summary is offered as a means of highlighting some of the available information on the use of small groups for instructional purposes. The Center staff is prepared to provide more detailed information either in departmental workshops or in consultations with individuals wishing to design instruction using small groups.

ADVANTAGES AND DISADVANTAGES OF SMALL GROUPS

There are both advantages and disadvantages in the use of small groups for instruction. Among the advantages are that students learn to work cooperatively in an atmosphere which provides opportunities to verbalize over the content material. They also become more personally involved in the learning process, have a deeper sense of connectedness to other students, and learn some of the responsibilities of being a group member. Students will often work harder in the presence of others because of the stimulation from observing others' work. Although the traditional role of the teacher as the only "knowledgeable source of information" is usurped with learning groups, much is gained as the students relinquish being primarily "passive receptors of knowledge." By taking an active role of intellectually searching for and conveying knowledge to each other as well as their teachers, students learn to incorporate multiple perspectives in shaping their own views. Comparing, selecting and synthesizing, both their own and others' ideas, are just some of the steps involved in this process. Development of these modes of thinking helps prepare the students to function in today's changing world.

A disadvantage of small groups is that they utilize more class time than other strategies. Occasionally a teacher might feel a sense of isolation from the students and a loss of control. Further, teachers have noted that the quality of student learning is not always even during group instruction.

HOW IS A SMALL GROUP USED FOR INSTRUCTIONAL PURPOSES?

Small groups can be used in various ways as an effective instructional tool. For example, the method can be used as a way of enabling students to:

1) Discuss a piece of literature for an English class.
2) Produce a videotape, a paper, or a set of recommendations in a communications class.
3) Analyze case studies as in business applications.
4) Conduct laboratory experiments in science classes such as chemistry.
5) Provide a critique or feedback of the writing of fellow students.

6) Solve a group task by pooling resources such as in engineering or architecture.
7) Provide practice drill sessions for reviewing exams.
8) Observe and evaluate events outside the classroom as in the sciences.

Groups can be of short duration, lasting part of a class period to allow as many students as possible to express an opinion, or they can be organized for the entire quarter for students to work on a group project or produce a group product. They can allow students to use each other as a resource or sounding board, or just give each other feedback. Because of this flexibility, TAs who use small groups for instruction can add variety to their teaching and provide a change of pace for students.

ISSUES INVOLVED IN USING SMALL GROUPS

Planning

Although the use of small groups appears to allow students more spontaneity, it requires careful planning and implementation. The involvement of the instructor is a vital part of this method of instruction since awareness of the group process and the relationships among group members is extremely important. The leadership functions of the instructor using this method are to: 1) create conditions in the classroom so that work can be accomplished, and 2) to organize work activities so that appropriate learning may be achieved.

Group Size

There are varying viewpoints as to what constitutes the "ideal" size of a small group for instructional purposes. Decisions regarding size are largely dependent on the instructional setting and the task. A two- or three-person group might be optimal for specific problem solving, whereas a group consisting of as many as eight or nine students might be perfect for a general discussion.

Changing Teacher/Student Roles and Relationships

Using small groups optimally for instructional purposes requires that the more traditional roles of teacher and student undergo a change. Teachers can perform both an **expert** and a **helping** function in such multiple roles as: motivator, resource person, and evaluator. At the same time students learn to take on various group member roles such as: contributor, initiator, information and opinion seeker and giver, evaluator and procedural technician.

Evaluation

Evaluation of group work can take many forms, from evaluating a group product where all the students receive the same grade to the observation and assessment of individual work. Since participation in learning groups reduces the degree of individual recognition, instructors need to be aware of the potential problems this can create and be cognizant of the instructional strategies which will moderate the situation. Sometimes a combination of individual and group evaluations are used to assign a student's grade for the quarter.

BIBLIOGRAPHY

Book, C. & Galvin, K. (1975). Instruction In and About Small Group Discussion. Urbana, IL: ERIC.

A comprehensive small book touching on some of the reasons for using groups in the classroom. A brief overview of theory and practice is given, including problem solving and group discussion.

Johnson, D. W. & Johnson, F. P., (1975). Joining Together: Group Theory and Group Skills. Englewood Cliffs, NJ: Prentice-Hall.

This book provides theory and experiences necessary to develop an understanding of group dynamics and effective group skills. The numerous excercises included in the book will greatly add to the repertoire of instructional strategies in small group instruction.

Olmstead, J. A., (1974). Small-Group Instruction: Theory and Practice. Alexandria, VA.: Human Resources Research Organization.

This book is mostly comprised of the objectives, the planning and commonly used methods for small group instruction.

Schmuck, P. A. & Schmuck, R. A., (1983). Group Processes in the Classroom. (4th ed.). Dubuque, IA.: Wm. C. Brown Company.

A comprehensive book dealing with group development, norms, communication and expectations. In addition leadership, friendship, group conflict and the social psychology of groups are discussed.

Trow, W. C. (1960). Role functions of the teacher in the instructional group. In N. B. Henry (Ed.), The Dynamics of Instructional Groups. (pp. 30-50). The 59th yearbook of The National Society of the Study of Education. Chicago, IL: University of Chicago Press.

An edited book with contributions from a number of well known authors on group dynamics, the sociopsychological characteristics and the diagnosis and guidance of the structure of instructional groups.

CIDR CONSULTATION ON STUDENT WRITING

CIDR staff work with faculty and TAs, individually or in specially designed workshops, on more effective ways of using writing as a teaching tool in courses throughout the U.W. curriculum. To date, we have provided information, materials, consultation, and workshops on the following:

- designing effective writing assignments in keeping with course objectives
- using various methods of evaluation and criteria for student writing (can include group sessions to reach instructional staff consensus on a particular assignment)
- *responding* to student papers vs. *correcting* and *editing*
- working with revision and multiple drafts
- conferencing one-to-one on student drafts
- using peer response groups (includes a 30-minute videotape demonstration of procedure)
- designing alternatives to the term paper (in-class writing, assignment sequences, journals)
- developing classroom activities on topics of special concern to course instructors (*stages of the writing process, generating a thesis, writing the critique paper*)
- connecting writing and critical thinking, reading, and discussion
- teaching writing as a *process* of learning vs. writing to *test* learning

We will be happy to plan a workshop with you on writing that meets your TA needs. Clip and return the form to CIDR, DC-07. Call Chris Farris at 3-6359 or 3-6588 for more information.

(Please cut along dotted line. Send in campus mail to CIDR, DC-07.)

[ ] I would like to arrange a workshop on assigning and evaluating student writing for Fall TA Orientation in our department.

[ ] I would like to arrange a consultation and/or workshop for another time during Fall Quarter.

NAME: _____ TITLE: _____

DEPARTMENT: _____ PHONE: _____ MAILSTOP: _____

INTERNATIONAL TEACHING ASSISTANT PROJECT SUMMARY

The International Teaching Assistant (ITA) Project is a four facet program designed to prepare international graduate students to fulfill their role as teaching assistants. The four facets include: first, a 35-hour week long orientation prior to fall quarter; second, during the academic year we offer a variety of workshop topics from which departments can choose; third, also during the academic year we hold individual consultations with international teaching assistants; finally, and also during the academic year, we offer classroom observation/feedback sessions to those who have classroom responsibilities.

The goals of the ITA Project are to assist ITAs in learning:

1) Linguistic strategies and vocabulary specific to instructional contexts.
2) Various instructional strategies used in American university classrooms (such as lectures, discussions, and demonstrations.)
3) Interpersonal communication skills that will allow the ITAs to understand and cope with cultural differences in American classrooms.
4) The views of faculty, administration, parents and undergraduates toward teaching and learning.
5) The historical roots of the American educational system and how they shape beliefs and attitudes about teaching and learning.

To inform the development of the program, we draw from Second Language Learning, Instructional, and Intercultural Communication literatures. Several kinds of data have been gathered to inform the development of this project. The Spoken English Assessment Test (SPEAK) was used to assess oral communication competency. That measurement was taken both before and after an individual performed her/his TA responsibilities for two quarters. In addition, data consisting of student ratings were gathered on participants in the program who had classroom responsibilities. Finally, a survey of all ITAs on our campus was conducted last year (1984-85) and is currently being analyzed to establish a profile of their backgrounds, responsibilities and concerns.

If you would like further information about how international teaching assistants in your department might participate in this program during the 1986-87 academic year, please clip and return the form to CIDR, DC-07.

(Please cut along dotted line. Send in campus mail to CIDR, DC-07.)

ITA TRAINING PROGRAM INFORMATION REQUEST

DEPARTMENT: _____ PERSON TO CONTACT: _____

POTENTIAL TOTAL NUMBER OF ITA'S FOR 1986-87: _____ POTENTIAL NUMBER OF NEW ITA'S FOR 1986-87: _____

CIDR VIDEOTAPE FACILITES AND SERVICES

TEACHING LAB: ROOM 203 PARRINGTON HALL

CIDR maintains a teaching lab that can be used by TAs and faculty for instructional development. The teaching lab consists of a classroom with two wall-mounted color cameras and a monitor. Behind the classroom, in a separate room is the remote facility with a video switching board and remote controls. The camera operator sits here and electronically moves the two cameras and adjusts the sound for an optimum recording. A special effects generator located on the switching board allows for the simultaneous recording of instruction on one half screen and student responses on the other half. This facility makes it possible for Center staff to help instructors analyze their instruction and to offer assistance for increasing instructional effectiveness.

VIDEOTAPE SERVICES

VIDEOTAPE OF INSTRUCTOR AND CLASS WITH CONSULTATION: This service consists of videotaping a TA in either the CIDR teaching lab or regular classroom followed by a consultation with a trained CIDR staff member. The consultation includes identification of instructor strengths and areas for improvement, as well as strategies for change.

VIDEO COACHING (SIMULTANEOUS FEEDBACK): This service consists of the use of a small transistorized earplug which makes possible coaching by a trained CIDR staff member as the TA is in the act of teaching. This process is very useful for learning how to conduct discussions in quiz sections or labs or in one-to-one tutorials. Because of the special wiring necessary for this method of instructional development, the CIDR teaching lab is the only location where simultaneous feedback is offered.

MICROTEACHING: This service consists of a teach-reteach process using videotape to record an initial mini-teaching lesson, followed by a critique of the initial attempt and re-teaching of the mini-lesson incorporating the suggested improvements. Microteaching can be done in either a one-to-one setting or a group workshop setting. TA representatives and coordinators can be trained to facilitate the process, or CIDR will provide trained staff. Although microteaching can be done in individual departments, many instructors elect to hold microteaching sessions in the teaching lab because of the recording versatility and ease with which tapes can be made.

SCHEDULING CIDR VIDEOTAPE FACILITIES AND SERVICES

There is no charge for using the teaching lab. Scheduling is on a first-come-first- served basis. You may contact Center staff at 543-6588 if you wish to use the lab and services. Advanced booking is recommended, especially for on-going projects.

Center for Instructional Development and Research
107 Parrington Hall, DC-07, University of Washington
Seattle, WA 98195

Small Group Instructional Diagnosis
(Class Interviews)

As instructors think about evaluating their teaching, they frequently seek insights into a variety of pertinent questions. For instance, does the course organization provide for optimal student learning? Is the presentation enhancing or detracting from the content? What material is seen as relevant or irrelevant? Is the pace of the course too fast or too slow? In an effort to answer such questions, instructors frequently seek systematic ways to obtain objective input.

Small group instructional diagnosis (SGID) is a method of course evaluation designed to help instructors answer such questions. The method, commonly conducted at midterm, uses class interviews with students to provide suggestions to strengthen the course, increase communication between the students and the teacher, and generally improve instruction. The process not only identifies problem areas, but also generates alternatives for the suggested revisions.

SGID Procedure

The SGID process requires an experienced consultant to work directly with the instructor and the students in the class. The process is initiated when the consultant and the instructor meet to discuss the course and determine how the class interview process can best be used to provide feedback for instructional improvement. Then, on the given day, the consultant meets with students in the class, in the absence of the instructor, to obtain the data. The consultant directs students in the class to form small groups, select a chair and come to consensus on answers to three questions:

1. What do you like about the course?
2. What do you think needs improvement?
3. How do you recommend that suggested improvements be made?

Following ten minutes of discussion, the consultant asks students to report their deliberations to the entire class. The consultant collects and summarizes the groups' ideas on the blackboard, clarifying until group members are satisfied that the consultant understands clearly the information being reported. The instructor and consultant then meet to discuss the data and develop a teaching improvement process responsive to the data and the specific needs of the instructor.

Benefits to Students and Instructors

Student and instructor response to the method has been outstanding. Students appreciate the midterm timing, which provides opportunity for changes to affect them, and the heightened teacher awareness of student concerns. Instructors appreciate the personal interaction and supportive interpretation by a consultant, as well as the content of the data in a form which facilitates its use by the instructor in making changes.

Scheduling an SGID

The SGID process is also appropriate for evaluating special programs such as TA Orientation. If you are interested, the Center staff is available to discuss the ways in which the SGID process can be used to meet your specific instructional needs. If you would like Center staff to facilitate an SGID in one of your classes, it is best to contact the Center well before midterm of the quarter during which you would like assistance. Early planning will allow you to make the best use of the student feedback for instructional improvement.

CIDR Research

From time to time, instructional requests directed to the Center from UW faculty and graduate teaching assistants require formal research approaches. CIDR staff work side by side with department members using a variety of educational research methods to solve instructional problems occurring within a department or across departments. In addition, CIDR staff conduct ongoing research projects to respond to theoretical or practical needs for research on topics related to instructional issues at the University of Washington.

Selected projects currently underway include:

TA Instructional Interests Assessment

The TA Instructional Interests Assessment Project is an attempt to survey the needs and interests of graduate teaching assistants across the campus. The Center is interested in collecting data on TA perceptions concerning: 1) the instructional skills required for TAs to teach effectively in specific disciplines, 2) available resources, 3) the level of faculty supervision, and 4) their instructional interests. In addition, the survey includes an assessment of concerns or difficulties which TAs encounter at the University of Washington. The survey will also provide useful demographic information for TA training planning including TA preparation for teaching prior to UW appointment, previous teaching experience, and variety of courses taught by TAs.

The questionnaires have been distributed and the data will be analyzed during the summer of 1986. Results of the study will be used to plan subsequent TA Training Planning Meetings and will be made available to individual departments upon request.

In addition, similar information is being collected in an interview format in three departments in the Life Sciences. The goal of this survey is to provide knowledge and understanding of the instructional concerns and needs of beginning TAs in the Life Sciences. This information will also be made available to the respective deparmtents.

Large Class Study

The large class study has been a year-long project designed to explore student and faculty perceptions of large classes at the University of Washington. Using questionnaires administered to students in large classes and qualitative methods of interview and observation, the CIDR researchers compiled data from students enrolled in large classes, faculty who teach large classes and TAs who assist in large classes. Results of the study will be used to increase understanding of students and faculty engaged in teaching and learning in large classes at the University of Washington.

Since large classes commonly involve TAs who assist with quiz sections, evaluation, cirriculum design, and management, the insights provided in this long-term study are useful for all TAs who anticipate assignments related to large classes at the University.

Teaching Awards Study

Responding to a request from Arts and Sciences, CIDR has undertaken a study to identify those departments throughout the University who recognize outstanding teaching by making an award to members of their instructional staffs. Data have been collected covering the details of these awards and includes information concerning the frequency of the recognition, the selection criteria and process, the types and numbers of recipients, the time and method of award presentation, the steps in publicizing the event if any, and the department's satisfaction with its current practices.

Copies of the Teaching Awards Study are available through CIDR, and Center staff are available to assist departmental representatives in designing appropriate teaching effectiveness awards (ranging from basic department chair recognition letters to formal banquet presentations) which would be appropriate for encouraging effective teaching of all staff including graduate teaching assistants.

CIDR Exit Survey Study

The general goal of the Exit Survey Study was to provide assistance to departments interested in collecting systematic evaluative and diagnostic feedback about the instructional experiences of their graduating students. This study was based on the assumption that exit or graduate survey data serve as a valuable component of departmental program and instructional development. Departments that use graduate TAs to provide instruction to undergraduate students can use exit surveys to gather feedback about the training and instructional experiences of TAs. This data can then be used to inform the development of departmental TA training programs.

The specific purposes of the Exit Survey Study were fourfold: 1) To identify how many departments or programs at the University of Washington employ department generated exit surveys to gather information from graduating students, 2) To identify what type of information is gathered and how it is used by individual departments/programs, 3) To identify criteria for determining the usefulness of an exit survey for particular departmental needs, and 4) To provide suggestions and models for developing and implementing exit survey questionnaires.

Based on questionnaires sent to all academic departments/programs on campus and telephone interviews conducted with non-respondents, this study identified 27 departments (22% of total respondents) that employ department generated, as opposed to University-wide, exit surveys. Exit survey users provided the following information: survey return rates, dissemination and return procedures, and types of information requested from students. Exit survey users and non-users indicated their perceptions of the usefulness of gathering each type of information and explained why they chose not to collect certain types of information via exit surveys. Non-survey users provided rationales for not employing exit surveys. In addition, respondents indicated what other methods they employed for collecting student evaluative feedback. Based on the responses provided by exit survey users, six steps for designing and implementing exit surveys are elucidated in the study. Copies of the exit survey study are available through CIDR, where staff consultants can assist departmental representatives in designing exit survey questionnaires modified for specific departmental needs. Model questionnaires from a variety of departments are also available to interested departmental representatives.

Evaluation of Teaching Effectiveness

The Center for Instructional Development and Research has been conducting an in-depth investigation of two evaluation procedures used for assessing teaching effectiveness on campus. This study is based on an earlier pilot study (Wulff, Staton-Spicer, Hess & Nyquist, 1985) that concluded that students prefer some form of midterm rather than end-of-the-quarter evaluation of teaching effectiveness. The present study explores student satisfaction with methods of evaluating teaching effectiveness based on whether evaluation is: 1) conducted at midterm or end-of-the-quarter, 2) based on data collected through standardized forms or qualitative statements generated from student discussions in small groups, 3) combined with specific feedback to the class from the instructor.

International Teaching Assistant Survey

CIDR is currently analyzing data from two surveys conducted with the International TA (ITA) population at the University of Washington. The goals of the survey are to provide: 1) a demographic profile of the ITA population, and 2) an analysis of ITA instructional concerns. These data will also identify how ITAs attempt to explore campus resources--both individuals and instructional materials--to resolve their concerns and cope with instructional differences. Survey results will be available by Summer, 1986.

Preventing Burn-out in Teaching Assistants

Maurice Hunt
Baylor University

Those of us who have worked in some capacity with graduate teachers of college writing — whether that capacity be supervisor of their teaching or advisor in general — have probably been confronted at least once with the following scenario. It is a rainy, Thursday afternoon late in February, that most forgettable of months; twelve wan-looking graduate teachers of freshman writing, each of whom takes two graduate courses and teaches two sections of writing per semester, file into the flourescent-lit, antiseptic classroom for his weekly seminar in the teaching of writing. Someone coughs and receives a glare partly malevolent, partly sympathetic (for the glarer coughs, too). This is the group that in late August of the prior year was tanned from summers spent in Italy, in the Rockies, in Southern California. This is the group that each week in the seminar eagerly sought to understand the psychological needs and expectations of late-adolescent relativism in essay evaluation, the grading of sets of papers may be postponed or avoided altogether.

If these are major effects of burn-out in teaching assistants, what are some specific causes of the malaise? A few are fairly obvious. We all remember how it felt when we first realized that some students actually didn't want us to be so intensely "meaningful" to them and to their lives. TAs often realize for the first time that the students whom they will spend a lifetime teaching often don't care as much about the literature or ideas that led the TA to get good grades as an undergraduate and graduate student. That hurts. Then again, August's TAs could never have suspected how painful it is to confront a failing student with his or her ineptitude, a confused, inadequate student who loads guilt on the TA, who weeps before the TA, who makes the TA feel personally responsible for the impending loss of the student's scholarship, or life-long dream of becoming a surgeon. Never could the new teacher of writing have imagined that the emotional distress and feeling of failure felt by the student could be felt so directly and so often by his or her teacher.

Other causes come from the TA's new conviction that he or she, in a semester or even in a year, cannot make the positive changes in a student's writing style or level of skills that the TA imagined would quickly occur. Often a new teaching assistant has a romantic view of the writing process; good writing results easily from the inspiration of great literature or the teacher's presentation of an exciting idea. Rarely is the TA mentally prepared for the unromantic experience of teaching the intricacies of prewriting students, needs and expectations expertly presented by a resident educational psychologist; this is the group that sought to grasp Kinneavy's theory of discourse, looping, cubing, tagmemics, the issue tree of Flower and Hayes; this is the group that responded politely and enthusiastically to the Director's presentation of the phases in teaching a problem-solution essay, as well as to his account of Toulmin's logic. This is the group that kept careful notes and added material to their wide three-ring binders, their initial resource books for a lifetime of teaching writing and literature. This is the group that, pale, in late February has forgotten to bring the resource book of August. This is the group made up of twenty-two, twenty-three, twenty-four-year olds who have, in the past twenty-two weeks of instruction, on the average graded a total of from 550 to 600 freshman essays. This is the group that is physically tired.

And yet physical fatigue does not, in large part, explain the listless behavior of February's graduate teachers. These TAs suffer from a common ailment that strikes all of us from time to time: burn-out. Burn-out often occurs when a worker no longer believes that a demanding task achieves meaningful results or "makes a difference" for an individual or for a community. A worker once compensated for physical exhaustion and psychic depletion by an idea of self-worth or self-importance. As that idea erodes through the gradual opinion that one's work is not as important as one supposed, personal satisfaction declines or becomes minimal and burn-out appears. Compulsive and gifted workers, such as Thomas Alva Edison, demonstrate a fact that most of us intuitively know: if you like what you're doing, you can work like the blazes and feed off the emotional and intellectual highs of your labors. Workaholism is a disease, to be sure; but those vibrant heart-surgeons who sleep only five hours a night teach us that physical fatigue, by itself, does not completely explain the graduate teaching assistant's ennui. His or her problem is deeper because it involves emotional exhaustion deriving from the giving way of an idealistic striving to the half-conscious conviction that his or her teaching is not making a bit of difference to students. TA burn-out is reflected in the graduate student's February belief that he or she could assign tens, dozens, even hundreds of essays; that he or she could dutifully note all the comma splices, the misplaced modifiers, the misspelled words, the illogical transitions, the ununified paragraphs, the mixed constructions, only to see college freshmen make the same errors on the next groping effort, and the one after that, and the one after that. In other words, August's bronzed TA has come to the winter prejudice that little he or she does in the classroom or writes on a student essay will make a difference to freshmen who seem resistant to education, who seem so slightly to resemble the freshman that the TA remembers being. The listlessness and apathy resulting from the frustrations described above often express themselves as a vague complaining on the TA's part concerning a variety of rapidly shifting subjects. In February, teaching assistants may become openly skeptical of the value of the required weekly seminar; more specifically, they may suddenly question the worth of learning the aspects of composition theory. At the same time, TAs may become "gimmicky," or games-oriented, in their lesson plans in a disguised effort to cheer up both themselves and their students. Direct accusations and confrontations with students may also occur during scheduled conferences, which the TA may now on occasion forget or neglect. Finally, the burned-out TA is likely to be more skeptical than ever of the possibility of objectively determining an "A," "B," or "C" letter grade. In fact, a certain relativism may creep into most phases of his or her teaching. As a result of a new writing, drafting, revising, and editing. Chilled, the TA discovers in January during a student conference that freshmen are no longer even reading the teacher's marginal comments, mainly because they don't understand them or can't read the handwriting or the abbreviations. Too often the freshman writer has told the TA that his or her high school English teacher liked his or her writing, that the student wistfully looks back on all those liberally written papers about literature, on all those ungraded or loosely graded journals, on all those extra-credit "projects." The TA is tired of hearing that he or she is scrooge — an inhumanely demanding person, the polar opposite from the humane teacher of high school. The teaching assistant now mistakenly imagines that most of his freshmen have not been adequately prepared by former writing teachers, that no one seems to have ever taught them grammar or correct writing; he or she perceives that he is expected to shoulder a burden that others have not assumed in the student's twelve prior years of schooling — that he or she must "make up" in a final semester of year-long writing course what did not happen in four years of high school. To accomplish this desperate, this Herculean pedagogical task, the teaching assistant is sometimes told that he or she must not teach imaginative literature in the writing course because so much remedial instruction must responsibly be delivered instead.

In this context of explicit or implicit assumptions, the TA naturally may feel angry and frustrated, especially if his or her own knowledge of grammar and ability to teach it is at all shaky. In the midst of all these negative feelings, the teaching assistant most likely is experiencing the grinding pressure of what it means to be a graduate student at a university. Having a seminar paper due in a course on the same day as one receives fifty freshmen essays can be demoralizing and nerve-wracking at the same time. In those departments with a prescribed syllabus for freshman English, or even in those with numerous required course units that must be integrated into everyone's course plan, burn-out in teaching assistants may proceed from the graduate student's dawning conviction that her class is not really her course,

but the Director's or that of whoever made up the required syllabus or course units. Thus, burn-out may derive from the TA's feeling that he or she is simply an inexpensive robot, an automaton, a "cog" in the departmental machinery for processing thousands of freshman writers. With little "say" in the classes he or she is teaching, the teaching assistant may realize that he or she was more of a person as an undergraduate praised and given special attention by faculty. Finally, burn-out may proceed from the teaching assistant's conviction that he or she receives little guidance in the teaching of writing, in how to deal with those demanding freshmen. The TA may feel that not only does no one in the department know what he or she is doing in the composition classroom, but also that no one would really care about the TA's instruction if he did know what was going on.

These causes of burn-out can be present in part or in total, and of course they can combine in the most devilish of ways. What can be done to prevent burn-out in teaching assistants? Helping the TA to perceive improvement in students' writing obviously will defuse the graduate teacher's feelings of ineffectiveness. First, freshmen writing often improves when essay assignments are intellectually challenging. Problem-solving agendas, based upon the Flower and Hayes model, and thesis-anthesis-synthesis assignments (wherein the student considers two sides of a question before fashioning a compromise) often lead to better writing. Secondly, TAs can often perceive change when they try to do more with less; targeting specific areas for improvement allows the student to focus. Initially, the TA identifies, with the student's assistance, those three or four areas for improvement; then the TA and the student make a "pact," the TA agreeing to only grade, for a short while, those targeted areas and the student vowing to do his or her best to learn the correct grammatical and paragraphing principles. Assigned remedial exercises or workbook lessons often are most effective here.

Allied to this targeting approach might be general instruction in how TAs can improve their essay evaluations. Teaching TAs to write positive summary comments, in which two or three areas for improvement are specified, can improve freshman writing when the student must complete remedial work in these areas, presenting it to the TA before the next essay is due. Thirdly, defining a performance plateau to be reached by groups of students within a class by the end of a semester, or at various points within a semester, can have beneficial results for a teacher as well as students. According to diagnostic essays, students can be grouped by common problems or by varying skills-levels; the TA then might meet with each group, agreeing on different performance plateaus and creating the programs to reach them. Such plateaus do not need to be tied in with essay grades but can exist independently of them to reinforce the learning process. Finally, I have found that encouraging TAs to structure classes around revision workshops helps improve freshman writing. A detailed plan for revision of a draft, perhaps in the three phases described by Maxine Hairston in *Successful Writing*, permits the student to write a paper that does not frustrate the TA during evaluation. All of these methods are designed to allow the TA and the freshman to perceive definite improvement in some aspects of the student's writing, thereby averting the graduate teacher's impression that he or she is wasting time teaching.

Furthermore, teaching such imaginative techniques of prewriting as looping and cubing, and instructing freshmen how to sensitively create articulated cumulative, periodic, and mixed sentences, for example, help freshmen realize that expository writing can be every bit as "creative" as it appeared to be during high school English classes. Imaginative assignments in stylistics can thus create a positive attitude within the freshman that makes the teaching assistant positive about his or her classroom.

Directors of Freshmen English can do much during their initial training workshops, their weekly meetings, and in their guidance systems to alleviate TA burn-out. During the initial workshop, the Director might supply data about how important writing skills will be for freshmen later in life, about how, for example, 20 to 25% of a new employee's time, regardless of profession, is spent in writing tasks. Moreover, during the workshop a faculty advisor, or "buddy," might be assigned to each TA; by meeting individually each week with the TA, the advisor, through suggestions for lesson plans, essay evaluation, and so on, helps the TA to understand that his or her work is understood, appreciated, and guided. Finally, during the workshop, TAs should be encouraged to create their own syllabi for their classes; required course units can be described generally so that the TA must decide upon their sequencing and the details and strategy of their implementation. Reflected in an individual syllabus, these decisions insure that the TA "owns" the class he or she teaches. When the syllabus is *not* the Director's, the TA is likely to become invested in the success of his course plan. Of course, any alterations in the TA syllabus ought to be done delicately at the conclusion of the workshop.

At some point in the semester, TAs might participate in in-service training with teachers of writing in the regional secondary schools. Such participation often begins a dialogue between high school and college English teachers that can go a long way toward dissolving the TA's feeling that high school teachers somehow have made life more difficult for the TA. Such in-service training works best when high school and college teachers, including the graduate teaching assistant, alternate non-threatening presentations of what has worked in the composition classroom. After such an in-service session, TAs might be sent on a tour of local high schools, where they can constructively discuss with secondary school teachers how the TAs and the teachers can form a liaison effective for the college freshman's learning.

The weekly meeting offers the Director several opportunities for activities that can prevent burn-out from occurring. Straight instruction in the weekly meeting should always be mixed with periods in which the TAs teach each other. Having different graduate teachers present a lesson that worked in the writing classroom not only bolsters the presenter's confidence; it also allows him or her to realize that he has something important to communicate. Such presentations can be constructively critiqued and discussed, thus involving everyone actively in a learning process. The videotaping of some of these presentations, with the TA's permission, of course, provides a forum for the non-threatening discussion of improving teaching techniques. In addition, during the weekly meetings TAs might learn imaginative ways of teaching grammatical principles so that they and their students do not feel bored to death. One way involves the wholesale and repeated use of the blackboard; different groups in a class might be assigned the writing of compound, complex, and compound/complex sentences. Volunteers from each group then write sentences on blackboards, thus permitting the whole class to judge their correctness with respect to the requisite number of dependent and independent clauses. The TA might encourage the class as a whole to refashion sentences on the board, so that compound/complex sentences of several clauses are created. This approach allows the TA to teach the use of commas and the semicolon as well as parallelism and correct modification without the drudgery of workbook exercises.

Finally, teaching assistants should be encouraged to share their own writing with a freshman class in order to help students understand that the TA is practicing what he or she preaches. By showing students various pre-writings, drafts, and revisings of a graduate seminar paper soon due, the teaching assistant can describe how he struggles and succeeds through a disciplined use of the writing process. Such a description often commands the student's respect, helping the freshman to perceive the TA as an ally rather than an aloof adversary. When conveyed to the teaching assistant, such respect is contagious: the instructor finds it easier to "like" not only his class but his profession as well.

All of these suggested approaches and techniques are not guaranteed fire insurance against TA burn-out. Still, carefully implemented, they can do much to inoculate graduate teachers against their most common complaint.

The TA is not just a miniature professor. Careful consideration of the TA's unique situation with respect to students leads to recognizing the necessity for TAs to use a variety of teaching methods and course formats.

Why TA Training Needs Instructional Innovation

John D. W. Andrews

Performing the basic tasks of a TA requires a repertoire of teaching methods and class formats, many of which are unfamiliar to most TAs. Such a repertoire is needed to resolve certain recurring and baffling problems that TAs find hard to deal with in the context of lecture or recitation formats. The saying has it that if your only tool is a hammer, you are apt to go around treating everything as if it were a nail, a saying that basically describes the situation faced by a TA who has only traditional instructional methods to draw on. Accordingly, the aims of this chapter are, first, to spell out the central TA functions and how they fit into university education as a whole and, second, to present an array of innovative approaches—all of them field-tested by TAs in typical undergraduate courses—that can be employed to carry out these functions.

Core TA Functions

First, the TA is a source of personal contact and interaction with students. TAs usually teach small classes to students of about their same age, thus providing an opportunity for informal interaction with students inside and outside class. Students, especially in the earlier years, need encouragement, models, and understanding of their problems. Providing for these needs does not necessarily involve personal confidences—although it sometimes does—

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rather, it involves a demonstrated interest in students' learning motivation and progress. The element of personal contact affects student-to-student interactions, too. *The TA needs to be* a facilitator of group communication so that students will feel free to participate in class and make the most of their opportunities to learn from each other.

Second, the TA is in the best position to help develop higher-level thinking skills through coaching, guidance, and feedback. These skills—involving analysis, creativity, and evaluative judgment (Bloom, 1956)—cannot be fostered in large lectures, but only in Socratic interaction. The teacher must be able to observe the student thinking aloud and then help to shape this process (Whimbey and Lochhead, 1980). Students need to be as active as the teacher—for example, in writing or scientific (mathematical) problem-solving assignments; and, if we are to take seriously the rhetoric in most college catalogues, then the TA should be a vital agent in the development of critical minds. This role is doubly important, because it most strongly affects students in the lower-division years, during which crucial intellectual skills are being formed.

Finally, the TA often must provide a communication channel that helps to integrate the course. The preparation that students bring to a course is often below what a professor expects, and the degree to which a professor elaborates different topics may be beyond a student's ability to understand. Course goals may be presented vaguely or may be misunderstood because of incorrect assumptions on the part of students and professors alike. The basis of grading may be misleadingly explained or misinterpreted by students. The TA who handles section meetings for a lecture course is in the best position to see students' problems close at hand, to field most of their questions, to correct misimpressions, and often to play the major part in evaluating tests or papers and assigning grades. Thus, the TA can serve as a two-way communication channel between students and professor, making suggestions about course planning, elaborating on incompletely covered material, explaining evaluation criteria to students, and providing practice in developing critical thinking skills.

To illustrate some of the things students are looking for in their teachers, there follow some comments from a group of freshmen who took part in a TA training retreat.

> This guy knows me, you know, he understands my situation and he wants me to learn and so I want to learn. That's what the TAs gave to me last year. He cares about me. I wanted to learn more about chemistry because the TAs wanted to teach me more about chemistry. Words like "you can do it," maybe, or "this is important," or, like, "it's not as bad as it looks," that's a good one; "it looks bad now, but after a while . . ." the whole course is a psyche-out, if you can get the people to think they can learn it, they'll learn it.

> I think it's establishing an environment where there's constant participation all the time. When there's a lot of lecture, you just don't get used to raising your hand. I remember one time I raised my hand and answered a question, and I felt so ridiculous, because the whole class turned around and stared at me.
>
> They would put problems up on the board, and of course no one would know how to do them, which was probably natural, but what they showed me in particular was how to look at the problem, how to analyze it, and how to use all given data that you have, and how to make use of that data in solving for various parts of the equation — to see how he sets it up, how he takes the data he's given and arranges it so he can use a simple formula to solve it. And it was by doing that over and over again and by constantly seeing the TAs, so that they would show me if I was going off on the wrong track, that I was eventually able to get some kind of a method in looking at these problems.

The three TA functions — interactive learning, coaching in the higher thinking skills, and providing a communication channel to integrate the course — stand out quite vividly in these students' comments.

How, then, do we help TAs to carry out these functions more effectively? In our workshops, we use two major means. First, we provide a simple but complete planning system, which the TA can use in either of two ways: to organize his or her own section work, and to assess or analyze a course for which he or she is serving as a TA. A second major resource for TAs is a "toolbox" of classroom activities designed to stimulate students to take active, participative roles in the classroom.

A Course Planning Guide for TAs

The planning guide is a grid incorporating five stages. These are based on the concept of performance objectives in learning. The guide is not a microscopic analysis of behavioral outcomes, such as that advocated by Mager (1975). Rather, it emphasizes that a course must be integrated, and it helps TAs articulate goals in terms of tasks that students will be able to do at the end of the course but cannot do now. Table 1 shows our planning guide.

The instructor fills in each box with the appropriate information and thus creates a schematic course outline. We stress that planning begins with Box 1, on the right: "How do you want students to be changed . . . ?" The guide works across to Box 5 on the left: "How are your expectations communicated to students?" (We sometimes call this guide the Chinese Planner, because the planning steps, like Chinese writing, are written in right-to-left order.) When the guide is completed, the teaching sequence can be implemented from left to

Table 1. Teaching Objectives Planning Guide

Instructions. It is in the nature of objectives, or outcomes, to arrive last, yet our concept of the outcome can have an important influence on what leads to the objective. In this sense, defining objectives is the first step in planning a learning activity. For this reason, we ask you to work in right-to-left order, beginning with question 1, in thinking through your teaching plans. The result should be a sequential model of what you intend to do, which can then be implemented from left to right, beginning with box A in the second row.

5. How are your expectations communicated to students? What is their picture of the objectives they will need to meet?	4. What about the "how" of teaching? What sorts of formats or activities will you use to help students practice the abilities needed to meet (1) and (2)?	3. What subject-matter content will you cover in order to help students meet the expectations in (1) and (2)?	2. How are these changes to be measured? What sorts of performances by students will be the criteria?	1. How do you want students to be changed as a result of this class? What will they perceive, or be able to do, that they cannot do now?
(A)	(B)	(C)	(D)	(E)

right, beginning with the introduction (A) and ending with objectives accomplished (E).

As mentioned, this model can be used by TAs to plan their own teaching work or to gain perspectives on the course as a whole and how their efforts should fit into it. One interesting way to do the latter is to interview the course professor, using the questions of Box 1; another is to preview the tests or assignments due later in the course as a way of seeing concretely how objectives are to be embodied in the measurement system (Box 2). In workshops, we often use the teaching situations of one or two TAs as examples. We begin by asking about student learning outcomes. Often, the TA is unaware of these; they have been unstated, taken for granted, put purely in terms of content, or phrased so generally that they are meaningless. Trying to deal with these questions often stimulates the TA's curiosity about the professor's answers and the possible gaps that may show up later in the course. New TAs are busy figuring out how to handle today's class, and so the end of the course (three months away) may seem remote and irrelevant. This walk-through exercise provides a needed corrective, showing that one can teach fruitfully in the present only in the light of one's destination.

Course objectives (Box 1) should deal with subject matter as well as thinking skills, and should be embodied explicitly in the measurement system (Box 2), and should be congruent with what goes on in lecture and in section. To say that the material covered (Box 3) should match the objectives seems so obvious that it scarcely needs mentioning, but it is not uncommon for students to prepare largely from lectures and then face a test based on the textbook. Thus, we stress that TAs, in helping to integrate the course, should look closely at the match between course content and measurement emphasis.

Even more important – and more often neglected – is the teaching process. Academic tradition tends to stress content while ignoring both the "how" of mental operations and the "how" of classroom interaction patterns. It seems to be assumed that mental operations are the student's private responsibility and that classroom interaction patterns are covered by the rituals of lecture, lab, and recitation. We stress that what goes on in a section should be direct practice for what will be expected later on in tests or in papers. If, for example, the test will ask students to make complex judgments concerning historical forces, there should be plenty of integrative, analytic discussion in class. If the test is to be based on multiple-choice or short-identification questions, however, it is quixotic to expect students to get interested in broad issues; it is better to help them with the mnemonic skills necessary to keep facts and dates in their heads.

The latter point provides a lead-in to handling Box 5: orienting students to course expectations. Some TAs fear answering students' questions about testing, because they do not want to "give away" the exam. I sometimes point out that this reluctance leads to an equally untenable stance: "Let's confuse students as much as possible about how they are going to be tested so that they

will not study for the test, but will learn a lot of material so as to be prepared for anything." This stance is neither fair nor efficient. What is the alternative? We return again to the governing role that well-formulated objectives can play in teaching. If the objectives are broadly described and involve intellectual challenge, and if that challenge is embodied in the measurement/grading system, then both the content and the thinking approach required can be conveyed to students via syllabi, assignments, and class activities. If assignments and activities are similar to graded performances that will come later, and if this parallel is made clear to students, then they can be led to adopt a useful mental set without the teacher's giving away specific bits of test information.

Learning Format Designs

The most exciting and creative aspect of teaching may well involve filling in Box 4: devising a learning process. Here lies the challenge to arrange class interaction so as to stimulate various sorts of thinking, communicating, and learning in pursuit of specified outcome objectives. As mentioned earlier, the "how" of teaching is at once the most pivotal and the most neglected aspect of course design, especially in higher education: pivotal, because it simultaneously orients students to what is expected and embodies ultimate objectives in concrete form; and neglected, because of the pervasive tendency to think of learning only in terms of content and to take for granted the standard formats of lecture, lab, and recitation. For these reasons, the remainder of this chapter provides practical ways by which TAs can enhance learning by consciously developing the "hows" of classroom process.

Drawing Out Student Questions. Figure 1 is borrowed from our program's teaching newsletter, and is aimed at focussing TAs' attention on the subtle barriers that can prevent student participation.

Of course, the final conclusion in Figure 1 may be perfectly correct, but it may also be the result of subtle communication barriers. In Figure 1, these include the facts that there is no clearly defined way for the individual student to respond and that there are only very narrow ways in which everybody can respond (simultaneous head nods or shakes). Then, too, the instructor's question implies that he or she is poised to continue and only needs the class's assent, and so anyone raising a question must swim against this current. Finally, any student who does ask a question is labeled as one who is slow to get the point. For all these reasons, many students who do have important questions will be reluctant to speak up.

What, then, to do? We find that some deceptively simple changes can improve students' responses and help instructors read the level and direction of students' concerns. Consider this alternative to the first question in Figure 1: "Who would like me to discuss this some more?" (This question is accompanied by a gesture indicating that students should raise their hands if they do want more explanation.) This formulation has many advantages. It provides indi-

Figure 1. Unraveling the Mysteries of Classroom Communication

After years of work, we have finally cracked the nearly impenetrable code of educational communication. This breakthrough is based on the realization that the quickest way to misunderstand a message is to assume that it means what it says. Here, we offer one sample from our *Dictionary of True Educational Meanings*.

"Finding Out How Much the Students Understand"

What the instructor says

"Does everybody understand this?"

What the instructor apparently means (and may sincerely intend)

"Would anyone who doesn't understand please indicate this by asking a question so that I can explain further?"

What the students hear

"I hope you understand this, but if you don't, I don't really have time to explain it to you, because I have a lot to cover and I have to keep moving to hold the interest of the people who do. Besides, you dummy, you should be prepared so that you will understand, and if you can't, maybe you don't belong here, so for God's sake, if you don't understand, don't bother me about it, and try to look as if you do understand."

What the students do

Nothing.

What the instructor concludes

"These people aren't interested. They just want to sit there like bumps on a log and have me pour stuff into their minds without their having to think."

vidual students with a clearly defined mode of responding. It creates a channel for group responses, which can be pooled to give the instructor an overview of class understanding. It enables students to respond simultaneously and thus avoids singling out any individual. It indicates a genuine readiness to stop and explain further. And it provides a face-saving label. Wanting more discussion carries less of a stigma than not understanding. As a result, the psychological threshold to participation is lowered.

Agenda Setting. This format elaborates on the example in Figure 1 by establishing a new system for handling puzzlements. Jointly with the students, the instructor sets an agenda at the start of each session. An agenda is so familiar that we take it for granted in most formal meetings; its lack in a classroom is seldom noticed, and the result is considerable confusion and inefficiency. *Agenda* means a list on the board (to which all present can contribute) of the most important topics to be covered in a TA-led section. The TA asks, "What topics or questions are on your minds—interesting or perhaps confusing questions that we should cover today?" The TA then acts as recorder or clarifier as ideas are brought up. Often students spark each other's thinking and remind each other of missed points. The TA, too, may add items if he or she is aware

of important topics that students have not mentioned. Another function of the TA is encouraging additions to the list, which ensures that all students take the risk of speaking up. If the list is too long or diverse, a show of hands can determine the priorities of the class as a whole, and some items can be deferred to office hours.

What are the advantages of agenda setting? The most obvious is that it gives everyone a clear roadmap of what the class session will deal with and thus, paradoxically, gives more control both to the TA and to the students: to the TA, because he or she can see the whole spectrum of student concerns and anticipate how to handle them; and to the students, because they have a clear channel for getting their needs met and can also anticipate what will be covered in the rest of the session. By contrast, when the TA simply asks if there any questions, everyone is left in the dark: How many other students have this question? What other sorts of questions are not being asked? What is most important? These uncertainties are removed by an agenda. Also, the TA can more gracefully handle a question to which he or she does not know the answer by deferring it or by using the time it takes to complete the agenda to search his or her memory for the answer. Finally, the TA can also reshape and integrate the list—for example, by combining several initially unrelated items into a single topic that can be handled in a unitary way.

From the student side, contributing to an agenda is an opportunity to get one's concerns raised. The TA continues adding to the list until even the most reluctant students will have had their chance. And, once one's item is securely on the list, one can relax and really pay attention to all the other answers. Finally, the fear of not asking a "good" question is reduced. One can simply indicate a topic in one or two words, without feeling pressure to articulate confusion cleverly.

Icebreakers. Icebreakers are simple, light ways of warming up the class so as to maximize personal contact in teaching. The problem with many icebreakers is that they are often seen by college teachers as frivolous or time-consuming or both. Two simple ones, which largely avoid these drawbacks, are (1) brief pair discussion and (2) milling and matching.

In brief pair discussion, the TA says, "Please turn to the person next to you, introduce yourselves, and talk for two minutes." The TA can assign almost any topic to be discussed. The discussion can be about confusion left from last week's lecture, and resulting questions can be fed into an agenda, or it can be about a key question that introduces the day's topic. It can also be about the next steps to take in solving a complex science problem or about one's opinion on a controversial issue. In any case, this is a relaxed way to foster acquaintance and also get almost everyone in the class talking and thinking actively in a short amount of time.

Milling and matching involves "milling"—free circulation of students, in which brief one-to-one contacts are made. Each student has been given a bit of information, and attempts to find one or more others with matching or

related bits. Since each temporary pair must discuss their respective pieces of information, there is opportunity for lots of introductory contact and a chance to review some aspect of course material. For example, a chemistry TA gave each student a diagram of a complex molecule and asked successive pairs to discuss whether their two molecules would bond together or not. A literature TA gave out short passages from several works under study, and asked students to judge, on stylistic grounds, whether each partner's passage was written by the same author. For a review session, a sociology TA gave half the students the names of key concepts, while the other half had brief descriptions of social behavior; the task was for each pair to decide whether one partner's behavior sample was an instance of the other's concept. Milling and matching requires more time than agenda setting—about ten to fifteen minutes—but it has the same basic virtue of being time-efficient and combining acquaintanceship with informal learning.

Student-Formulated Questions. Formulating a good discussion question is an excellent way to crystallize one's own understanding of material. As a means of encouraging students to think actively, TAs have found it useful to give them the responsibility of developing questions. One TA phrased the assignment this way: "Read this poem and think about what puzzles you about it that would also be a good discussion question. Then you will ask your question and be teacher to the class." She asked students to meet in small groups for five minutes at the start to plan questions and then devoted the discussion to each group's question in turn. After a few weeks of practice, students usually produce quite sophisticated and stimulating questions—better, in fact, than those of many teachers. Another approach is to have students produce written questions as assignments. The TA selects the best ones as discussion starters and returns all questions with comments. This method can be used in science classes; for example, one chemistry TA asked his students to work in small groups and make up questions for the following week's quiz. Each group was given a key concept and asked to devise a problem exemplifying it.

Active Student Participation in Class Work. Students can take over a great deal of the learning activity in class if the format encourages them. The TA shifts from being primarily an information giver to being a guide who asks challenging questions, gives information as needed, and keeps the students on track.

One useful approach is to construct an agenda, as previously discussed. Then students form into small groups, and each group is assigned one of the major agenda items to work on. Later, each group presents its material to the entire class. Usually the mix of expertise in each small group is enough to produce an answer; if not, the TA provides suggestions and presents a summary at the end to take care of unanswered questions. In another variation, each small group is given a teacher-designated problem or question to work on; this is selected to highlight important conceptual issues. About halfway through the class session, each group nominates a spokesperson to present its solutions

to the class. In one experimental research study (Andrews, 1981) this student-centered format was compared with the more usual instructor-centered style of handling chemistry sections. Students in the two types of sections did about equally well on major exams, and reported learning about the same amount from the TA, but they learned more from fellow students in the experimental format. Also, students who labeled themselves as collaborative on a questionnaire learned the most from the group format, whereas the self-defined competitive students did better with the instructor-centered approach. This suggests that one must weigh student learning styles as well as teaching considerations in selecting a format.

Other TAs have experimented with the discovery method, in which students are given a minimum amount of information and asked to develop ideas creatively on their own. An intriguing example was reported in the press recently:

> Students at the prestigious Massachusetts Institute of Technology are getting credit for playing in a sandbox. In M.I.T. professor Woodie Flowers' annual design competition, students are given a package of eighty motors, gears, springs, tubes and widgets to build a machine that will move tennis balls from one end of a sandbox to the other. The winner was sophomore Mark Schlueter. His device has mechanical arms, fires a projectile at an opponent's machine to slow it down, and grasps five balls at once to carry them across an eight-foot sandbox. "They hand us a pile of junk and that's what we have to use!" Schlueter said. "What they teach us in this class is that nothing works the first time."

In the natural sciences, a systematic approach to discover learning based on the work of psychologist Jean Piaget has been developed by Karplus (Karplus and others, 1977). Using this method, we recently conducted a comparative study of discovery and lecture-demonstration teaching as part of a TA-led pre-midterm review session in chemistry. The lecture group was given a presentation on stereoisomers (variations in the structure of molecules) followed by an opportunity to demonstrate the main points by using small kits from which molecule models could be assembled. The discovery group was simply given a brief definition of *stereoisomer* (which they had already heard about in lecture and read about in their textbook) and then given various tasks (some using the molecule model kits) to be accomplished in small groups, with the TA acting as a consultant. Unlike the M.I.T. contest, this was a routine teaching task, conducted under the usual pre-examination pressures and tensions.

We found that on a postsession quiz, the discovery students scored almost half again as high as the lecture students—9.2 versus 6.7, even though the time allotted was the same for both. There were also differences among students with different learning styles: Self-described independents liked the

discovery method, while self-defined dependents were less enthusiastic. It is surprising and interesting that, in spite of these differences in attitude, both types of students did better in the discovery format, the difference is only in the size of the advantage. For the independent students, the gap was very large (10.4 versus 6.5) while for the dependent students, it was only 8.7 versus 7.0. This is strong evidence that the less structured discovery methods have a useful place in the daily activities of most undergraduate courses, even in the "one-answer" sciences, and that they are a valuable option for TAs to consider. Besides, they're fun!

We have also found it useful to base TA-led discovery activities on the brainstorming method (Osborne, 1963). This approach enhances divergent thinking by dividing problem solving into two phases. In the first phase, participants are encouraged to generate as many ideas as possible, deliberately suspending their doubts and criticisms. Apparently wild ideas are encouraged, while evaluation and disagreement are prohibited. This phase generates an uninterrupted flow of ideas, which are recorded. Then, in the second phase, the group sets up evaluative criteria; weighs, combines, and elaborates ideas; and eventually moves toward selecting those that are most useful.

For example, one literature TA began a discussion of Hemingway's *A Farewell to Arms* with this question: "What possibility for refuge are there in this novel?" He listed a variety of student suggestions on the board, adding others of his own; some provocative ideas began to emerge. One student suggested "Death might be a refuge from the fear of death," while another said, "This may sound strange, but everyone seems to be eating all the time in the book!" Later, the group examined these and many other forms of refuge, tested their ideas against textual evidence, and began to develop their own interpretation of the novel.

The natural sciences, too, are amenable to the brainstorming approach, even though conventional campus wisdom has it that these are disciplines in which creativity is possible only after years of absorbing information. Certainly, the M.I.T. project cited above would have been aided by brainstorming; and, on a more basic level, there are many times when multiple-answer group activities are very helpful. In solving mathematical word problems, for example, a first task is to extract from the problem statement the givens and other relevant data. The TA could say, "Let's list on the board all the information we can get from this problem." Later, at a difficult point in the problem solution, the TA could list various concepts, formulas, and approaches students think will be helpful, just as was done with the "refuge" example.

Brainstorming rearranges the classroom in several advantageous ways. In the first phase, it helps students feel free to participate by removing the fear of being judged wrong or looking foolish, since evaluative comments are temporarily out of bounds. Later, when the ideas are evaluated, they are somewhat detached from the person who voiced them, since they are included in a list; hence, the situation is safer, and students are also encouraged to support

each other, since one person's idea often will suggest a related idea to someone else. Finally, brainstorming helps students develop, through its two phases, the intellectual skills of synthesis and evaluation (Bloom, 1956).

Debates create another dynamic that is the polar opposite of brainstorming. While brainstorming favors collaboration, debates sharpen conflict and subject ideas to challenge and testing. For certain purposes, debate can be very useful. In one debate variant, called the change-your-mind debate, the room is divided into three banks of chairs: one for each of the two opposing sides, as is customary in debates, and a third bank for the undecided. As the debate proceeds, the key ground rule is that any time a person changes his or her mind—from one side to another, from undecided to decided, or vice versa—he or she is to get up and move to the area of the room that represents his or her new viewpoint. This movement provides a fluidity missing in typical debates and leads people to evaluate their ideas continually instead of rigidifying them. It also means that the spatial arrangement of the participants is at any one moment a "snapshot" of how the debate is going; even those not speaking are making statements through their seating positions. The philosophy TA who invented this format believed it would lead to his main teaching objective: to help students develop philosophical argumentation skills.

Another way in which students can take responsibility is by devising the debate question. Sometimes the question is selected by brainstorming and then choosing one that is certain to stir up issues crucial to the class. For example, one ecology-minded group in a wilderness policy course chose to debate whether Eskimos should be restricted in their killing of seals. They realized that their general values supported both the preservation of the Eskimos' traditional way of life (which depended on a seal-slaughtering economy) and the protection of an endangered species. Pitting these values against each other was sure to produce a searching examination of how they should be applied. The debate format can also be used in "one-answer" disciplines if the issue is carefully chosen. For example, a TA in one fluid-mechanics lab posed a problem to his students that was based on an application of Toricelli's law. This TA had learned by experience that students tended to be polarized in their intuitive solutions to this problem, which provided the makings of a fruitful change-your-mind debate. The students were able to use the debate format to work out and support their solutions to the problem on general conceptual or precise mathematical grounds.

Learning Objectives-Based Review Sessions. Here, we return to the theme of objectives. TAs should plan their section activities with learning outcomes in mind, and students will learn best if they have a "roadmap" based on those objectives. Thus, the same five-step framework by which TAs and professors can orient themselves should also be helpful to students:

One literature TA conducts an objectives-based review near the end of the term. It is organized around a series of three short brainstorming activities, which conclude by preparing students to handle the essay exam. The first

segment deals with the broad skills that students felt they were expected to learn, or did learn, from the course. In an English literature class, for example, students contributed such objectives as "learning to love Chaucer," "relating the author's message to the time," "seeing how humans viewed the world," "tying together universal themes," "understanding how to analyze a work of literature." The TA selected the last two of these for emphasis and conducted a second brainstorming session to compile specific themes that had arisen during the course: ambition versus desire, the individual versus the supernatural, concepts of time, and issues of the family, for example. Finally, the TA chose one of these themes, which she knew would not be on the exam, and worked through a sample essay-construction sequence with the students. Three columns were drawn on the board. The first listed works in which some aspect of the theme had appeared, the second listed the aspect of the theme at issue in each work, and the third dealt with more specific situations in which these aspects arose. The students were then asked to choose the three works that they found to be the most similar and to develop thesis ideas and topic sentences for an essay, as they would on the exam. These ideas and topics were shared with the class, and the similarities and differences among them helped students refine their conceptions of what could be done with the assignment. Thus, they were given new tools for planning an on-the-spot exam essay and were also helped to see the assignment in the context of course objectives.

Another and somewhat simpler review was carried out in a history class. The TA began by asking, "What kinds of questions do we need to answer on the topic of slavery? What are the main points you would expect to handle on the short-essay exam?" Without commenting, except to stress conceptual rather than "facts and dates" questions, she gathered a brainstorm list from students. Then she began eliciting answers from the class, guiding them with leading questions extrapolated from the list. In the end, the students answered most of the questions and they also benefited from defining the conceptual scope of the topic for themselves.

Similar things can be done in the natural sciences. Asking students in small groups to construct quiz problems is one approach; by working out how each conceptual area can be represented by a problem at an appropriate level of difficulty, students learn much about the needed skills. A related method is to conduct a problem-solving skills brainstorm, in which students list all the tricks, tips, strategies, and general rules that usually characterize problem solvers. In teaching workshops, we often ask TAs to provide the same kind of list. They have come up with fascinating examples: "There may be unneeded information—learn to select what's relevant"; "Define the goal—what the solution will look like—and work backward"; "When you've worked out a solution procedure, try it first on a similar but simpler problem to which you know the answer"; "Keep a notebook of problems you found difficult; use it to pinpoint your characteristic problem-solving weaknesses."

Science TAs—most of them good problem-solvers themselves—always

come up with interesting suggestions, but it takes some work: One can observe how a group struggles to articulate the intuitively developed problem-solving methods that are used habitually and often unconsciously. We point out that to convey these methods to students, one must already have them explicitly accessible and that a similar brainstorm could set off the same reflection in undergraduates or at least make them more receptive to a list subsequently provided by the TA. Again, the point is to help students develop the broad intellectual skills that distinguish an active thinker from a passive learner.

A final format, useful for dealing with tests and objectives, is called the "old exam" technique and was created by a mathematics TA on our campus. He describes it as follows:

> I bring in a collection of problems they haven't seen, including many problems chosen from old exams. These I write across the top of the blackboard. When people come in, they know they are to begin working on them. I put stars by questions from old tests. Then I field homework questions for fifteen to thirty minutes, after which we'll go over the problems I've put up. The fact that the problems are from old exams is important enough to them that they are entirely in agreement with this approach. I pick and choose among the problems, in order to have a collection which covers the conceptual problems of the current material. I usually include one or two hard conceptual problems, to keep the interest of the best students. The collection as a whole gives everyone something to do while I'm answering questions about homework that gave certain people no difficulty. And so this is purpose number two: keeping the interest of advanced students. A third purpose is giving immediate feedback. Since most midterms are fifty minutes in length, some people like to see if, before the hour is through, they can do all the questions I've put up. This gets the group actively involved in problem solving during the section, getting stuck (perhaps), and then seeing how it is done right away. Thus, a fourth purpose is to give students a realistic view of potential test material—something they're always interested in and have a right to see.

New Teaching Roles

To implement these new formats with success involves learning new conceptions of the teaching role, as well as new interpersonal skills. To help them use these formats successfully, we must lead TAs beyond the oversimplifications that many teachers begin with: at one extreme, a lecture in which all the structure is provided by the instructor; and, at the other, an open seminar, which can become, at worst, directionless.

The TA must above all educate, in the literal sense of the term, which means "to draw out." One needs a repertoire of skills—asking leading ques-

tions, paraphrasing students' comments, probing for implicit assumptions, gently turning a question around to elicit more of a student's effort, synthesizing a wandering discussion, and so on. The main trick, of course, is to provide just the right amount of guidance, so that the students neither flounder on their own nor become too dependent, but grow in mastery and confidence.

The TA needs to be a designer of learning environments; this is the idea that underlies all the varied formats presented in this chapter. The TA arranges interaction so that certain types of thinking and communicating will take place. Thus, his or her primary responsibility shifts from presentation of content to guiding the learning process. Planning skills—a sense of what will work with a given group of students to reach a given objective—are required, as well as group-management skills. TAs must know how to present an unfamiliar format firmly and clearly to students; be able to intervene to keep a procedure on track without being heavyhanded or rigid; understand when and how to modify a procedure on the spot when the situation suggests a change of direction; and be able to draw explicit learnings from such open-ended activities as discovery sessions by playing the part of recorder/synthesizer for the group. A complete training program not only should familiarize TAs with new and useful formats but also must help them develop the skills needed to implement these formats constructively.

The three functions that TAs must perform constitute the distinctive contribution that TAs can make to undergraduate education. The objective-based planning model and a repertoire of class formats are means through which TAs can implement those functions. Much of the challenge in being a TA comes from artfully blending these functions, sometimes divergent or even contradictory in actual practice, into a working whole.

There is one more potential benefit in using the array of techniques described in this chapter, but this benefit will emerge only if they are used widely and frequently. Imagine that students, in moving from class to class, experience not only a variety of subject matters and ideas, but also a variety of formats for thinking and communicating. As Perry (1968) points out, the continued clash of ideas in college gradually shakes loose the preconceptions with which an entering freshman begins, but usually the medium for transmitting these ideas is limited and taken for granted. There are lectures, labs, and recitation sections, but suppose, instead, that the range of formats were as fresh, as interesting, and as diverse as the ideas themselves? Imagine a student saying, "I go from a class where we do debates right into a class where we work together on a group project. In the next class, we make up test questions for each other. It really gets me thinking!" Students in such a setting could begin to get the idea that different group formats are good for different kinds of thinking and communicating and in fact often shape thinking and that it is better to choose formats purposefully than simply to fall into them. This awareness would be a valuable contribution to any student's liberal education.

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The several functions that comprise teaching can be differentiated and shared in various ways with students to enhance learning.

Teachers and Learning Groups: Dissolution of the Atlas Complex

Donald L. Finkel
G. Stephen Monk

The Atlas Complex

Professor A is just concluding the culminating lecture on one of his favorite topics in his field. In earlier lectures, he painstakingly laid the groundwork, explaining each element and placing each detail of the theory in its proper relationship to the others. Today, he carefully ties the various components together to exhibit one of the most beautiful and powerful theories that he knows of. Each time that he lectures on this theory, he more clearly understands its depth and subtlety, and his lectures improve accordingly. Students find the theory difficult, and so he has learned to inject humor, personal views, and dramatic emphasis to get it across. Today, Professor A's pacing and timing work perfectly. He ends just in time to allow for his usual five minutes of questions. He asks, "Are there any questions?" A few students look up from their

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notebooks, but nothing else happens. He fills the silence by raising some questions that naturally arise from the theory. Then, he answers the questions. The students dutifully record the answers. One student asks a polite question about a specific fact in the lecture, and Professor A uses the occasion to expound still more on the theory. Another student asks the inevitable question about how much of the material will be on the exam. When the bell rings, Professor A is stirred by mixed emotions. He is pleased with how well he pulled the lecture together—it is easily the best version that he has given—but he is bothered by how little the students seem to have been moved by it. He has enough experience to know what the absence of real questions means. The students probably admire both his performance and the theory. But they do not feel the power of the theory, and they do not grasp how economically it answers so many deep questions. What must he do to get the excitement of his subject across to students?

Professor B is conducting a seminar in her own field of research. The topic for discussion is one of the seminal works in the field. Some students ask her to clarify certain passages, and she is able to do so clearly and completely. Then she asks a question that she believes to be central to the issues that underlie the work, and one of the brighter students responds in a very thorough and lengthy manner. But, inevitably, the student does not understand the full depth of the issue, and Professor B has a strong impulse to correct and clarify the student's answer. However, as an experienced seminar leader, she stifles this impulse and asks the students if they have any response to the first student's answer. Another student says that he disagrees with the first student and proceeds to give his own long and complete answer. Now, Professor B has two shallow and slightly incorrect answers to clear up. After doing so, she asks another question. She fixes her eye on one of the quieter students, and the student responds very tentatively, so that Professor B must encourage him and help to fill in the details missing from his answer. These separate, truncated dialogues between Professor B and each of her students continue until, out of something approaching desperation, she presses one student on what he means by one of his too neat, almost glib answers. As the student retreats into silence, a feeling of defeat overcomes Professor B. The work that they are discussing always stimulates her thinking with the freshness of its perspectives and insights. At each reading, it raises new questions in her mind. How can it fail to motivate a discussion as involving as those she has with fellow students in graduate school? The cause of the dry,

ritualistic seminar before her must be herself, she reasons. She has not asked the right questions.

Both these teachers are the central figures in their classrooms. Like most of their colleagues, they assume full responsibility for all that goes on. They supply motivation, insight, clear explanations, even intellectual curiosity. In exchange, their students supply almost nothing but a faint imitation of the academic performance that they witness. Both teachers so thoroughly dominate the proceedings that they are cut off from what the students know or are confused about. For their part, the students form a group of isolated individuals who have no more in common than their one-to-one relationship with the same individual. While Professors A and B exercise their authority through control of the subject matter and the social encounter in the classroom, they lack the power to make things happen for their students. They are both caught in the middle of their classes by a host of mysterious forces—hidden assumptions, hidden expectations, and the results of their own isolating experience. We call this state the Atlas complex.

In this chapter, we first examine the phenomenon of the Atlas complex. In the next section, we describe a third teacher, Professor C, who is very present in his class but who is not caught in the middle. This example allows us to broaden our perspective on the social organization of the typical college course and on the particular hold that it has on the teacher. Finally, we show the many ways in which this social system can be modified to free teachers from the middle without violating their sense of themselves as teachers. Such modifications should broaden and enrich their view of what they can accomplish as teachers. The result should be a more fulfilling teaching experience and a greater sense of what is possible—in short, a dissolution of the Atlas complex.

The Two-Person Model

Most teachers and students conceive of the heart of education as a two-person relationship. The ideal relationship is that of tutor and tutee alone in a room. Classes are seen only as an economic or pragmatic necessity in which one person—the teacher—either simultaneously engaged in ten or three hundred two-person relationships with separate individuals or addresses a single undifferentiated entity—the audience. Teachers who view their classes as an elaboration of the two-person model are cut off from the potential energy and inspiration that lie in student-to-student interaction or in the mutual support that a

group of individuals working toward a common goal can provide. Consequently, it becomes the responsibility of teachers to provide motivation, enlightenment, and a sense of purpose. Like Atlas, such teachers support the entire enterprise.

The sense of fixedness that stems from the two-person model of teaching has both a cognitive and a social component. The cognitive component stems from the teacher's expertise in subject matter, while the social component results from the teacher's occupying the role of group leader in the classroom. Teachers invest a large quantity of their time, energy, and hard work in becoming experts in their disciplines. They have a comprehensive understanding of their subjects and detailed knowledge of their subjects' intricacies and skills. How can they withhold these things? And if students do not get the point the first time, what can teachers do but give again or give more? By the very terms of the encounter, students lack something that the teacher has in abundance; thus, every activity in which the teacher does not give this "something" must play a secondary role. Teachers assume that their principal task is one of improving the ways in which they express their expertise: Clear and precise explanation can always be articulated and sharpened; penetrating questions can always be made more penetrating.

The social component of the sense of fixedness derives from the teacher's role of group leader. The literature on the social psychology of small groups (Slater, 1966) demonstrates that most groups in their early stages can be described precisely by the two-person model; that is, each member acts as if he or she were in an exclusive dyadic relationship with the leader. It is a long and arduous process for group members to break their dependence on the leader and to form mutual bonds with one another. But teachers are more than just leaders. Their expertise in the subject matter exacerbates the problem that all leaders face if they want to distribute responsibility to the individual members of the group. The teacher is the very embodiment of the group's goal—the subject matter. There is no doubt that teachers have all the answers. Why should students look to anyone else?

These forces hold teachers in place with their Atlas-like burden of responsibility. They prevent teachers from sharing some of their responsibilities with the group's members. But some teachers do try to make such a change. They allow individual students to take turns at leading the class, they form study groups of various kinds, they try to restrict their role in discussion to that of facilitator or resource person. And, when they encounter the intensity of the forces, they find them-

selves pushed back into the center by a cognitive force, by a social force, or by both.

The most striking consequence of allowing students to interact directly and collectively with subject matter without the teacher's mediation is that the teacher comes face to face with students' own partially formed and inadequate conceptions of the subject. As experts with carefully articulated and elaborate views of their subjects, and as representatives of their disciplines, teachers are bound to feel a strong personal discomfort in the presence of the kinds of imprecise, loosely connected, unintegrated comprehension that students have of their subjects. Thus, the very act of opening up and listening to students forces the teacher-expert back into the middle, because imprecise explanations cannot go unrefined, because all the connections have to be made, and because final conclusions have to be drawn. In short, the teacher returns to the center in order to mediate between the students and the material.

For their part, students are likely to resist the teacher's attempt to step out of the middle because they perceive this switch in roles as an attempt to abandon responsible leadership. Students who feel abandoned resent their teacher, and consequently they do not develop the enthusiasm necessary for learning. This in turn leads the teacher who tries to innovate and share responsibility for learning to become cynical about students. The primary reason for this sequence of reactions is that when teachers switch from the role of expert to the role of helper, their expertise gets lost. If students have no way to draw on the teacher's knowledge of the subject, it is natural that they learn less. The attempt to break the two-person model and to cause students to draw on the resources of the group can easily lead to a lowering of the intellectual goals of the class, in the eyes of both teacher and students. And since this is usually judged to be unsatisfactory, the teacher returns to the role of expert, and the students settle back into their seats to take in the teacher's illuminating words.

We have described the way in which the cognitive and social aspects of the two-person model keep teachers in the middle of their classes, carrying all the burden and responsibility of the course on their own shoulders. We have also described how the forces that typically operate on teachers, both from within and without, tend to move them back to the center when they try to leave it. People approach teaching with a set of conventional beliefs about the teacher's role that are strongly reinforced by being in the middle. Years of experience then fuse these beliefs into a whole, so that they cannot be differentiated, questioned,

or tested. Instead, they form a complex—a monolithic and undifferentiated state of mind that gives teachers so much responsibility for everything that goes on in the class that they cannot move—a state of mind that we call the Atlas complex.

But a teacher who takes responsibility for all that goes on in the class gives students no room to experiment with ideas, to deepen their understanding of concepts, or to integrate concepts into a coherent system. Most teachers agree that these processes, together with many others, are necessary if students are to understand a subject matter. Any teacher will say that the best way of learning a subject is to teach it—to try to explain it to others. Scientists agree that intellectual exchange, discourse, and debate are important elements in their own professional development. Almost anyone who has learned something well has experienced the particular potency that a collaborative group can have through its ability to promote and make manifest such intellectual processes as assimilating experience or data to conceptual frameworks, wrestling with inadequacies in current conceptions, drawing new distinctions, and integrating separate ideas. The evidence that collective work is a key ingredient to intellectual growth surrounds us. Yet, to judge by the typical college course, most teachers do not believe that it is either appropriate or possible to foster these important processes in the classroom.

Professor C

Before we examine how the Atlas complex can be dissolved, we will describe a class that does not have a teacher in the middle and that still benefits from the teacher's expertise. This should show that change is possible—that the forces holding the teacher in the middle are not irresistible. It should also illustrate the point of view that we wish to advance in the next section.

Professor C walks into his class of forty students and hands out a dittoed "worksheet" to every student. The students continue to chatter as they glance at the worksheet, start to form groups of five (as the worksheet instructs them to do), and seat themselves around the tables in the room. Gradually, the noise level falls as students read through the worksheet. Then, it rises again as they begin to engage in discussion with one another over the questions on the sheet. After a few minutes, Professor C joins one group, where he quietly watches and listens, but does not talk. A few minutes later, he moves to another group. After listening to the discussion there, he suggests to group members that they are not getting anywhere because they misunder-

stand the example given in the first question. He tells them to draw out in pictures what the example describes, and as they do so, he makes clarifying comments. He listens as discussion resumes, then moves to yet another group. Meanwhile, many students are not only talking but also making notes as they do. Some groups are engaged in heated discussion; others are quieter, as individuals pause to think or to listen to a member who reads a passage aloud from reading that accompanies the worksheet. In one way or another, however, all the groups are working with the sequence of questions and instructions contained in the worksheet.

Professor C may seem to be a teacher with no real function; indeed, he may even seem irresponsible. But keeping a class of forty students actively involved with course material with a minimum of direct support from the teacher requires an artfully written set of instructions and questions. Professor C puts all his expert knowledge, his most provocative questions, and his insights about how students comprehend the material into the worksheets. Breaking his own finished knowledge of his discipline down into its component processes, then provoking students to discover these processes takes at least as much intellectual work as a finely crafted series of lectures would require. But, having done this work and set the students to interacting with one another and with the worksheet, he becomes free to perform a number of helping teaching functions as well as to expound, probe, or press on the basis of his expertise. He can also take time just to listen to students. He is free to choose. (For a more complete description of the worksheet approach and its uses, see Finkel and Monk, 1978, 1979.)

Professor C revises his worksheets after watching his class interact with them (this is where listening becomes important), just as Professor A revises his lectures every time that he gives them. The difference is that Professor C bases his revision on direct observation, while Professor A must rely on his own perception of how he has done, supplemented by a few polite questions and test results. Like Professor B, Professor C always feels that livelier and deeper conversation would result it he only could ask better questions. The difference is that Professor C has had the opportunity to be an outside observer of students' conversation without the concerns of a discussion leader; thus, Professor C can gain a clearer view of what actually happens than even most seminar leaders can.

We offer the example of Professor C not as a model for Professor A, Professor B, or any other teacher to imitate. Answers to teaching problems are never easy. The example of Professor C shows that a teacher can be in his class without being caught in the middle. We will

use this example to illustrate a principle that lies behind a variety of possible course restructurings and that helps to relieve the teacher of the Atlas complex.

From Roles to Functions

Professor C serves as an expert in his class primarily through his worksheet. Since students focus on it and not on him, he is free to give clear explanations, to press for clearer answers, and to encourage hesitant students. The power of this approach stems from a fundamental differentiation of the teaching functions that make up the role of teacher. When these functions are differentiated and then distributed throughout a course, many of the constricting features that come from the role of teacher disappear and with them, the peculiar symptoms of the Atlas complex.

Brown (1965, p. 153) observes that "roles are norms that apply to categories of persons." In this case, the category is *teacher*, and anyone who fills that role is expected to follow a certain set of norms in his behavior. Moreover, roles do not exist in isolation; they are defined in interlocking sets, within the context of a given institution. In defining the role of college teacher, we necessarily define norms for college student as well. Social life flows smoothly because of these sets of roles. People enter the social arena knowing in advance what to expect; they have to be confident that the range of unpredictable behavior is strongly limited. Teachers who want to teach in a strikingly different way, for pedagogical reasons, usually find themselves crossing the limits of their role, violating some of the rules that define it. Students will be the first to force them back into doing what teachers are supposed to do; that is, into the conventional role of teacher. Thus, the very predictability that we need from roles can become so rigid by force of habit that the roles of teacher and student become overly restrictive and actually exclude the usual needs of cognitive life in the classroom.

Suppose now that teachers focus not on how they are supposed to behave but on the job that they are supposed to accomplish. Most teachers understand this job to involve such things as getting the students to understand a given theory, having students examine certain phenomena from a new perspective, or teaching students how to perform new skills. Each goal leads to certain mental processes that must be carried out. These processes include organizing and synthesizing a variety of specific facts, ideas, and events into a general scheme; engaging the particulars of a context or experience while maintaining a per-

spective on its general qualities and compressing and crystallizing connections made within the discipline or between a discipline and the area that it describes. Each process requires a different form of work from students and a different form of assistance from the teacher. A teacher operates in quite different ways depending on whether students are to organize and synthesize, to engage, or to compress and crystallize. Even within each mental process, the teacher has to make choices to act. We call particular ways of operating in a classroom *teaching functions*.

For instance, to get students to organize and synthesize specific facts and events into a general scheme, the teacher can perform such teaching functions as asking students to give their current interpretations of the specific facts and events, laying out projects that allow students to devise their own schemes, responding to students' work, and presenting the teacher's own organizing scheme.

In designing his worksheet, Professor C performed such teaching functions as interpreting student misconceptions, setting goals and tasks, and analyzing his subject matter. In his classroom, Professor C performs such teaching functions as listening to students, redirecting them, clearing up misunderstandings, and supporting students. Notice that analysis of classroom roles ties behavior to persons (teacher, students), while analysis of teaching functions ties behavior to tasks that must be accomplished. Some teaching functions can be performed just as well by students as by the teacher. Other teaching functions can best be performed by groups of students or even by combinations of student groups. As we show in the next section, a conscious decision about which teaching functions are to be performed by whom and where can be made as part of the design of the organization of the course.

The perspective of teaching functions makes the strong negative effects of thinking in terms of teaching roles quite clear. First, any role is inevitably confining. Many teachers acknowledge that a particular teaching function should be performed but that it is not. They say, "Such things are not done" or "Students won't stand for it." This is only a way of saying that their particular role does not permit it. And, because the role does not permit it, most teachers are not inclined consciously to articulate what teaching functions they deem most important for their students' learning.

Second, the language of roles itself creates dilemmas about the ways in which people are to behave. Teachers ask, Is my role of teacher one of expert or helper?, as if they must choose between these two roles.

The conflict disappears if the teacher performs functions that require expertise at one time and place and functions that require helping at others. To say that students must be *independent* (bold, skeptical, imaginative) and *dependent* (relying on the accumulated knowledge of past generations) sounds like a contradiction, because it is couched in the language of roles. The adjectives prescribe contradictory norms for a category of persons. But, if we say instead that some of the activities in which a student must engage require independence and that others require dependence, then the contradiction disappears. There is a time and a place for both independence and dependence when each characterizes a mode of engaging in a specific activity. But, as role descriptors they contradict each other.

Third, roles tend to generate their own work to be done, so that the teacher's activities are determined not by tasks but by roles and expectations. Thus, Professor A becomes a performer caught up in such functions as polishing, timing, and motivating, while Professor B becomes a stage manager of discussions who looks for the perfect sequence of questions so that the actors can play their parts.

Fourth, every role includes several distinct functions. When these functions are performed simply as part of the role, they tend to blur and merge; they are performed simultaneously, but none is performed particularly well. In trying to get feedback after he has spent forty-five minutes driving his points home, Professor A is fooling himself. Likewise, in trying to manage a discussion among students while maintaining high standards of rigor, Professor B performs neither function. A lecturer who gives illuminating examples to stimulate students' thought processes and then immediately gives her own perspective to explain these examples can think of herself as engaging students in a particular context and inviting them to form their own view of it, which she will then enrich. But, for students to perform such an activity in fact requires behavior from the lecturer that the students would tolerate. Thus, Professor B's students do not really go through the process, and she really performs just one function, exposition.

Distributing Teaching Functions in a Course

While most teachers acknowledge that their role is confining and wish to perform a wider array of teaching functions, they find that good intentions, even when backed by strong resolve, do not go far to promote change. To effect genuine change, a teacher must first differentiate teaching functions, then distribute them in the course so that

the responsibility for learning is shared with students. Only then can the Atlas complex be dissolved. To do this, the various parts of the course must be clearly distinguished so that the functions appropriate to them can be distributed.

When we think of making structural changes in a formal organization, such as a corporation, the candidates for transformation are immediately apparent. For instance, we can alter channels of communication, or change the authority relations between officers, or merge or divide departments. Like a corporation, a course is a social system. However, when it is viewed simply as a teacher and some students, it seems to lack the structural components that a corporation has, and thus it seems to lack candidates for transformation.

To distribute teaching functions, the teacher needs to distinguish three components in his course: specific activities that serve general teaching functions, people responsible for performing these activities, and the "places" in the course where these activities are performed. For instance, a teacher who wants to perform the teaching function of giving his own perspective on the subject can choose among such activities as these: giving a lecture, having students study a few key examples that exemplify the significance of his own perspective, and asking a highly convergent sequence of questions that point to that perspective. Further, there are many choices as to who performs each particular activity. The typical choice is between the teacher and individual students. However, there are additional candidates for this responsibility: Small groups of students working together can take over some teaching functions. In some instances, the entire classroom group can do so. Finally, there is an enormous array of "places" in any course where various teaching functions can be located. The obvious places include class sessions, tests, homework assignments, office hours, lectures, and quiz sections. These can be refined to include such places as Friday's class, critiqued but ungraded homework, files of past tests, required office conferences, and make-up tests.

Once teachers have differentiated the teaching functions to be performed and consciously distinguished the components of their courses that can be operated on, then they can make local decisions about the specific activities used to realize these functions, about who performs each function, and about where in the course the activity should be carried out. With this strategy for change, teachers can preserve existing activities that already serve important teaching functions and test new activities that may be able to take the place of activities that have not worked out well.

Faced with the complexities of the course as a social system, teachers may well wonder how to get started in such a program for change—particularly since, by our analysis, teachers themselves play such a dominant role in the system. Student learning groups, in which small numbers of students work together in a class without constant assistance from the teacher, can restrict the problem of systematic change to a problem of manageable size. Professor C divided his class into small groups that worked together for two hours, guided by the instructions and questions on the worksheet. Professor C performed many of the expert teaching functions by writing the worksheet, so that he became free in the class to perform many helping functions. Working in groups, the students perform such functions as asking and answering questions, giving support and reinforcement, and providing fresh perspectives on the subject. Each small group of students serves other important functions as well, such as providing carrying energy and bringing out low participators. But, the concept of learning group is extremely elastic. Learning groups can be permanent or temporary. They can work for five minutes, or two hours, or even longer at one time. They can be highly structured by the teacher or not. They can be required to devise group products, which are assigned group grades. Or, they can serve primarily as support groups for individuals.

Teachers who decide to use learning groups as part of a class, no matter on how small a scale, have taken a giant step out of the middle of their class, because in carrying out their decision, they distribute teaching functions, which forces them to deal with all the key issues involved in such a move. What concrete activities will be carried out in the groups? Who will have the responsibility for these activities? At what time and place in the course will learning groups be used?

Teachers who feel that a commitment to learning groups is too radical a step can take smaller steps in the same direction to divest themselves of some of their Atlas-like burden. For instance, Professor A could begin by distributing his beautifully polished lectures in advance and instruct students to read them as preparation for class. This puts him in a position to use the class time as an opportunity to serve a new teaching function. Since he is concerned with eliciting intelligent and informed questions from his students and with having a chance to respond to them, he can use the class period for just this purpose. He can have students bring prepared questions to class, where they can form the basis for a discussion, or he can simply respond to them publicly. He can take yet another step and use small temporary groups of students to drive the intellectual processes necessary for the assimila-

tion and organization of ideas derived from his lecture. To do this, he can distribute a short list of conceptual questions along with his lecture, which each group of students can be responsible for answering. Student work of this nature would enable him to perform yet another teaching function: critiquing without grading the students' response to his lectures. This teaching function would not only be beneficial to the students; it would help Professor A to revise his lectures, because it would give him a sharper view of his students' conception of the subject matter.

In much the same way, Professor B could write her telling and penetrating questions out for students to work on as they do their reading. To reduce her dominant role in the seminar, she can choose a small number of teaching functions to perform during class, to the exclusion of all others. If she still feels that her expertise is not being drawn upon sufficiently she can designate a segment of the seminar (the last fifteen minutes of each class or the last class of each week) in which she answers student questions or comments on student answers. However, she must do this in such a way that students see clearly that the expected behavior for this segment of the seminar is different from the behavior expected in the rest of the seminar.

In the preceding paragraphs, we have made a number of recommendations about how a course can be changed by distribution of teaching functions. However, it is important to remember that, as a social system, a course is not just a variety of distinct structural components; these components are strongly linked. If a change in one part of the system is to have lasting effect, the teacher must consider how this change interacts with other parts of the system. Change that is not integrated into the system will either be isolated and nullified, or it will distort the entire system. For instance, if learning groups are introduced, then their relation to the evaluation structure of the course must be made very clear. Exams signal to students more clearly than anything else what the teacher really cares about, and students direct their behavior accordingly. Thus, if group work is to be taken seriously, the results of group work must be tested by exams. That is, there should be a clear payoff to students for putting their energies into the new activity. Similarly, if the teacher deems collaborative work among students to be important and the teacher works hard to foster it in class, it makes no sense to grade exams on a curve, since students see such grading as a clear message that they are competing with one another.

However far one goes in distributing teaching functions, it is extremely important to set up clear boundaries around the various

"places" in the course to which distinct teaching functions have been assigned. Places can be marked off by such means as a designated day of the week or time in the day, a different classroom format, a different medium, a different physical location, or a different mode of evaluation. As long as teachers are absolutely explicit about the nature of the different tasks to be performed in the places marked off by such boundaries, they can ensure the predictability of behavior that people require when they drop stereotypical roles. A lecture carefully organized to give a highly polished overview of the subject indicates one set of behaviors for teacher and students, while a class period in which students work in groups on their first tentative explorations of the subject calls for another. A separate class period in which a panel of students presses the teacher with what they see to be the most important questions on the subject leads to yet another kind of behavior. As long as such class periods are clearly marked off, the diversity of expected behavior can create no confusion. There is a time and a place for students to be receptive and passive, curious and imaginative, challenging and doubting. Similarly, the teacher can assume an authoritative voice for a lecture, become a listener and helper in a worksheet class, and answer questions thoughtfully and carefully before a panel of students. As one boundary after another is crossed in a course, teachers and students can alter their behavior quite radically. All flows smoothly—just as long as the boundaries are absolutely clear.

Dissolution of the Atlas Complex

The perception that each course is in fact a miniature social system is perhaps the key to teachers' dissolution of the Atlas complex. The Atlas complex is a state of mind that keeps teachers fixed in the center of their classroom, supporting the entire burden of responsibility for the course on their own shoulders. This state of mind is hardened by the expectations that surround teachers and by the impact of the experience that results from them. A direct assault on the complex is doomed to fail.

The solution that we propose here is indirect. By focusing teachers' attention on their course as a social system, not on themselves as filling a role, we suggest that teachers can take specific, concrete actions that enable them to share responsibilities in the classroom. To do this, teachers must distinguish the various components of a course—the structural parts that comprise the social system—and distribute teaching functions into them.

There is a continuum along which the teacher can make such changes, ranging from small moves that share responsibility with students as individuals, to use of learning groups, which allows small subgroups of students temporarily to assume a number of different teaching functions, to delegation of major responsibilities to the entire group. We have found that the middle course of action—learning groups—is the most effective way to begin, for it opens up a great number of local possibilities for change while allowing the teacher to keep the fundamental structure of the curriculum and teaching intact.

Most teachers start with a small change, which enables them to experience their teaching in a different way and enriches their view of their course as a social system containing diverse teaching functions. This step leads to alterations in their own and their students' expectations of themselves, which deepen and expand their sense of further possible steps for change in the course. Each further step alters both their experience of teaching and their sense of what is possible. Only in this way is it possible to dissolve the Atlas complex.

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Responding to Student Writing

Nancy Sommers

More than any other enterprise in the teaching of writing, responding to and commenting on student writing consumes the largest proportion of our time. Most teachers estimate that it takes them at least 20 to 40 minutes to comment on an individual student paper, and those 20 to 40 minutes times 20 students per class, times 8 papers, more or less, during the course of a semester add up to an enormous amount of time. With so much time and energy directed to a single activity, it is important for us to understand the nature of the enterprise. For it seems, paradoxically enough, that although commenting on student writing is the most widely used method for responding to student writing, it is the least understood. We do not know in any definitive way what constitutes thoughtful commentary or what effect, if any, our comments have on helping our students become more effective writers.

Theoretically, at least, we know that we comment on our students' writing for the same reasons professional editors comment on the work of professional writers or for the same reasons we ask our colleagues to read and respond to our own writing. As writers we need and want thoughtful commentary to show us when we have communicated our ideas and when not, raising questions from a reader's point of view that may not have occurred to us as writers. We want to know if our writing has communicated our intended meaning and, if not, what questions or discrepancies our reader sees that we, as writers, are blind to.

In commenting on our students' writing, however, we have an additional pedagogical purpose. As teachers, we know that most students find it difficult to imagine a reader's response in advance, and to use such responses as a guide in composing. Thus, we comment on student writing to dramatize the presence of a reader, to help our students to become that questioning reader themselves, because, ultimately, we believe that becoming such a reader will help them to evaluate what they have written and develop control over their writing.[1]

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Even more specifically, however, we comment on student writing because we believe that it is necessary for us to offer assistance to student writers when they are in the process of composing a text, rather than after the text has been completed. Comments create the motive for doing something different in the next draft; thoughtful comments create the motive for revising. Without comments from their teachers or from their peers, student writers will revise in a consistently narrow and predictable way. Without comments from readers, students assume that their writing has communicated their meaning and perceive no need for revising the substance of their text.[2]

Yet as much as we as informed professionals believe in the soundness of this approach to responding to student writing, we also realize that we don't know how our theory squares with teachers' actual practice—do teachers comment and students revise as the theory predicts they should? For the past year my colleagues, Lil Brannon, Cyril Knoblach, and I have been researching this problem, attempting to discover not only what messages teachers give their students through their comments, but also what determines which of these comments the students choose to use or to ignore when revising. Our research has been entirely focused on comments teachers write to motivate revisions. We have studied the commenting styles of thirty-five teachers at New York University and the University of Oklahoma, studying the comments these teachers wrote on first and second drafts, and interviewing a representative number of these teachers and their students. All teachers also commented on the same set of three student essays. As an additional reference point, one of the student essays was typed into the computer that had been programed with the "Writer's Workbench," a package of twenty-three programs developed by Bell Laboratories to help computers and writers work together to improve a text rapidly. Within a few minutes, the computer delivered editorial comments on the student's text, identifying all spelling and punctuation errors, isolating problems with wordy or misused phrases, and suggesting alternatives, offering a stylistic analysis of sentence types, sentence beginnings, and sentence lengths, and finally, giving our freshman essay a Kincaid readability score of 8th grade which, as the computer program informed us, "is a low score for this type of document." The sharp contrast between the teachers' comments and those of the computer highlighted how arbitrary and idiosyncratic most of our teachers' comments are. Besides, the calm, reasonable language of the computer provided quite a contrast to the hostility and mean-spiritedness of most of the teachers' comments.

The first finding from our research on styles of commenting is that *teachers' comments can take students' attention away from their own purposes in writing a particular text and focus that attention on the teachers' purpose in commenting.* The teacher appropriates the text from the student by confusing the student's purpose in writing the text with her own purpose in commenting. Students make the changes the teacher wants rather than those that the student perceives are necessary, since the teachers' concerns imposed on the text create

the reasons for the subsequent changes. We have all heard our perplexed students say to us when confused by our comments: "I don't understand how you want me to change this" or "Tell me what you want me to do." In the beginning of the process there was the writer, her words, and her desire to communicate her ideas. But after the comments of the teacher are imposed on the first or second draft, the student's attention dramatically shifts from "This is what I want to say," to "This is what you the teacher are asking me to do."

This appropriation of the text by the teacher happens particularly when teachers identify errors in usage, diction, and style in a first draft and ask students to correct these errors when they revise; such comments give the student an impression of the importance of these errors that is all out of proportion to how they should view these errors at this point in the process. The comments create the concern that these "accidents of discourse" need to be attended to before the meaning of the text is attended to.

It would not be so bad if students were only commanded to correct errors, but, more often than not, students are given contradictory messages; they are commanded to edit a sentence to avoid an error or to condense a sentence to achieve greater brevity of style, and then told in the margins that the particular paragraph needs to be more specific or to be developed more. An example of this problem can be seen in the following student paragraph:

wordy - be precise which Sunday? ↓ comma needed

Every year [on one Sunday in the middle of January] tens of millions of

word choice

people cancel all events, plans or work to watch the Super Bowl. This

wordy

audience includes [little boys and girls, old people, and housewives and

Be specific - what reasons?

men.] Many reasons have been given to explain why the Super Bowl has

need info what spots?)

become so popular ~~that~~ commercial (spots cost up to $100,000.00.

awkward

One explanation is that people like to take sides and root for a team.

w. oth. - what? ↓ spelling

Another is that some people like the pageantry and excitement of the

too colloquial

event. These reasons alone, however, do not explain a happening as big as

the Super Bowl.

You need to do more research

This is a good start, but you need to be more specific and interesting to a reader.

In commenting on this draft, the teacher has shown the student how to edit the sentences, but then commands the student to expand the paragraph in order to make it more interesting to a reader. The interlinear comments and the marginal comments represent two separate tasks for this student; the interlinear comments encourage the student to see the text as a fixed piece, frozen in time, that just needs some editing. The marginal comments, however, suggest that the meaning of the text is not fixed, but rather that the student still needs to develop the meaning by doing some more research. Students are commanded to edit and develop at the same time; the remarkable contradiction of developing a paragraph after editing the sentences in it represents the confusion we encountered in our teachers' commenting styles. These different signals given to students, to edit and develop, to condense and elaborate, represent also the failure of teachers' comments to direct genuine revision of the text as a whole.

Moreover, the comments are worded in such a way that it is difficult for students to know what is the most important problem in the text and what problems are of lesser importance. No scale of concerns is offered to a student, with the result that a comment about spelling or a comment about an awkward sentence is given weight equal to a comment about organization or logic. The comment that seemed to represent this problem best was one teacher's command to his student: "Check your commas and semi-colons and think more about what you are thinking about." The language of the comments makes it difficult for a student to sort out and decide what is most important and what is least imporant.

When the teacher appropriates the text for the student in this way, students are encouraged to see their writing as a series of parts—words, sentences, paragraphs—and not as a whole discourse. The comments encourage students to believe that their first drafts are finished drafts, not invention drafts, and that all they need to do is patch and polish their writing. That is, teachers' comments do not provide their students with an inherent reason for revising the structure and meaning of their texts, since the comments suggest to students that the meaning of their text is already there, finished, produced, and all that is necessary is a better word or phrase. The processes of revising, editing, and proofreading are collapsed and reduced to a single trivial activity, and the students' misunderstanding of the revision process as a rewording activity is reinforced by their teachers' comments.

It is possible, and it quite often happens, that students follow every comment and fix their texts appropriately as requested, but their texts are not improved substantially, or, even worse, their revised drafts are inferior to their previous drafts. Since the teachers' comments take the students' attention away from their own original purposes, students concentrate more, as I have noted, on what the teachers commanded them to do than on what they are trying to say. Sometimes students do not understand the purpose behind their teachers' comments and take these comments very literally. At other

times students understand the comments, but the teacher has misread the text and the comments, unfortunately, are not applicable. For instance, we repeatedly saw comments in which teachers commanded students to reduce and condense what was written, when in fact what the text really needed at this stage was to be expanded in conception and scope.

The process of revising always involves a risk. But, too often revision becomes a balancing act for students in which they make the changes that are requested but do not take the risk of changing anything that was not commented on, even if the students sense that other changes are needed. A more effective text does not often evolve from such changes alone, yet the student does not want to take the chance of reducing a finished, albeit inadequate, paragraph to chaos—to fragments—in order to rebuild it, if such changes have not been requested by the teacher.

The second finding from our study is that *most teachers' comments are not text-specific and could be interchanged, rubber-stamped, from text to text.* The comments are not anchored in the particulars of the students' texts, but rather are a series of vague directives that are not text-specific. Students are commanded to "Think more about [their] audience, avoid colloquial language, avoid the passive, avoid prepositions at the end of sentences or conjunctions at the beginning of sentences, be clear, be specific, be precise, but above all, think more about what [they] are thinking about." The comments on the following student paragraph illustrate this problem:

↓ Begin by telling your reader what you are going to write about

In the sixties it was drugs, in the seventies it was rock and roll. Now in

avoid "one of the"

the eighties, one of the most controversial subjects is nuclear power. The

elaborate

United States is in great need of its own source of power. Because of

environmentalists, coal is not an acceptable source of energy [Solar and

be specific

wind power have not yet received the technology necessary to use them.]

avoid "it seems"

It seems that nuclear power is the only feasible means right now for ob-

taining self-sufficient power. However, too large a percentage of the

be precise

population are against nuclear power claiming it is unsafe. With as many

Think more about your reader.

problems as the United States is having concerning energy, it seems a shame that the public is so quick to "can" a very feasible means of power. Nuclear energy should not be given up on, but rather, more nuclear plants should be built.

These sentences marked

One could easily remove all the comments from this paragraph and rubber-stamp them on another student text, and they would make as much or as little sense on the second text as they do here.

We have observed an overwhelming similarity in the generalities and abstract commands given to students. There seems to be among teachers an accepted, albeit unwritten canon for commenting on student texts. This uniform code of commands, requests, and pleadings demonstrates that the teacher holds a license for vagueness while the student is commanded to be specific. The students we interviewed admitted to having great difficulty with these vague directives. The students stated that when a teacher writes in the margins or as an end comment, "choose precise language," or "think more about your audience," revising becomes a guessing game. In effect, the teacher is saying to the student, "Somewhere in this paper is imprecise language or lack of awareness of an audience and you must find it." The problem presented by these vague commands is compounded for the students when they are not offered any strategies for carrying out these commands. Students are told that they have done something wrong and that there is something in their text that needs to be fixed before the text is acceptable. But to tell students that they have done something wrong is not to tell them what to do about it. In order to offer a useful revision strategy to a student, the teacher must anchor that strategy in the specifics of the student's text. For instance, to tell our student, the author of the above paragraph, "to be specific," or "to elaborate," does not show our student what questions the reader has about the meaning of the text, or what breaks in logic exist, that could be resolved if the writer supplied specific information; nor is the student shown how to achieve the desired specificity.

Instead of offering strategies, the teachers offer what is interpreted by students as rules for composing; the comments suggest to students that writing is just a matter of following the rules. Indeed, the teachers seem to impose a series of abstract rules about written products even when some of them are not appropriate for the specific text the student is creating.[3] For instance, the student author of our sample paragraph presented above is commanded to follow the conventional rules for writing a five paragraph essay—to begin the introductory paragraph by telling his reader what he is going to say and to end the paragraph with a thesis sentence. Somehow these abstract rules about

what five-paragraph products should look like do not seem applicable to the problems this student must confront when revising, nor are the rules specific strategies he could use when revising. There are many inchoate ideas ready to be exploited in this paragraph, but the rules do not help the student to take stock of his (or her) ideas and use the opportunity he has, during revision, to develop those ideas.

The problem here is a confusion of process and product; what one has to say about the process is different from what one has to say about the product. Teachers who use this method of commenting are formulating their comments as if these drafts were finished drafts and were not going to be revised. Their commenting vocabularies have not been adapted to revision and they comment on first drafts as if they were justifying a grade or as if the first draft were the final draft.

Our summary finding, therefore, from this research on styles of commenting is that the news from the classroom is not good. For the most part, teachers do not respond to student writing with the kind of thoughtful commentary which will help students to engage with the issues they are writing about or which will help them think about their purposes and goals in writing a specific text. In defense of our teachers, however, they told us that responding to student writing was rarely stressed in their teacher-training or in writing workshops; they had been trained in various prewriting techniques, in constructing assignments, and in evaluating papers for grades, but rarely in the process of reading a student text for meaning or in offering commentary to motivate revision. The problem is that most of us as teachers of writing have been trained to read and interpret literary texts for meaning, but, unfortunately, we have not been trained to act upon the same set of assumptions in reading student texts as we follow in reading literary texts.[4] Thus, we read student texts with biases about what the writer should have said or about what he or she should have written, and our biases determine how we will comprehend the text. We read with our preconceptions and preoccupations, expecting to find errors, and the result is that we find errors and misread our students' texts.[5] We find what we look for; instead of reading and responding to the meaning of a text, we correct our students' writing. We need to reverse this approach. Instead of finding errors or showing students how to patch up parts of their texts, we need to sabotage our students' conviction that the drafts they have written are complete and coherent. Our comments need to offer students revision tasks of a different order of complexity and sophistication from the ones that they themselves identify, by forcing students back into the chaos, back to the point where they are shaping and restructuring their meaning.[6]

For if the content of a student text is lacking in substance and meaning, if the order of the parts must be rearranged significantly in the next draft, if paragraphs must be restructured for logic and clarity, then many sentences are likely to be changed or deleted anyway. There seems to be no point in

having students correct usage errors or condense sentences that are likely to disappear before the next draft is completed. In fact, to identify such problems in a text at this early first draft stage, when such problems are likely to abound, can give a student a disproportionate sense of their importance at this stage in the writing process.[7] In responding to our students' writing, we should be guided by the recognition that it is not spelling or usage problems that we as writers first worry about when drafting and revising of our texts.

We need to develop an appropriate level of response for commenting on a first draft, and to differentiate that from the level suitable to a second or third draft. Our comments need to be suited to the draft we are reading. In a first or second draft, we need to respond as any reader would, registering questions, reflecting befuddlement, and noting places where we are puzzled about the meaning of the text. Comments should point to breaks in logic, disruptions in meaning, or missing information. Our goal in commenting on early drafts should be to engage students with the issues they are considering and help them clarify their purposes and reasons in writing their specific text.

For instance, the major rhetorical problem of the essay written by the student who wrote the first paragraph (the paragraph on nuclear power) quoted above was that the student had two principal arguments running through his text, each of which brought the other into question. On the one hand, he argued that we must use nuclear power, unpleasant as it is, because we have nothing else to use; though nuclear energy is a problematic source of energy, it is the best of a bad lot. On the other hand, he also argued that nuclear energy is really quite safe and therefore should be our primary resource. Comments on this student's first draft need to point out this break in logic and show the student that if we accept his first argument, then his second argument sounds fishy. But if we accept his second argument, his first argument sounds contradictory. The teacher's comments need to engage this student writer with this basic rhetorical and conceptual problem in his first draft rather than impose a series of abstract commands and rules upon his text.

Written comments need to be viewed not as an end in themselves—a way for teachers to satisfy themselves that they have done their jobs—but rather as a means for helping students to become more effective writers. As a means for helping students, they have limitations; they are, in fact, disembodied remarks—one absent writer responding to another absent writer. The key to successful commenting is to have what is said in the comments and what is done in the classroom mutually reinforce and enrich each other. Commenting on papers assists the writing course in achieving its purpose; classroom activities and the comments we write to our students need to be connected. Written comments need to be an extension of the teacher's voice—an extension of the teacher as reader. Exercises in such activities as revising a whole text or individual paragraphs together in class, noting how the sense of the whole dictates the smaller changes, looking at options, evaluating actual choices, and then discussing the effect of these changes on revised drafts—

such exercises need to be designed to take students through the cycles of revising and to help them overcome their anxiety about revising: that anxiety we all feel at reducing what looks like a finished draft into fragments and chaos.

The challenge we face as teachers is to develop comments which will provide an inherent reason for students to revise; it is a sense of revision as discovery, as a repeated process of beginning again, as starting out new, that our students have not learned. We need to show our students how to seek, in the possibility of revision, the dissonances of discovery—to show them through our comments why new choices would positively change their texts, and thus to show them the potential for development implicit in their own writing.

Notes

1. C. H. Knoblach and Lil Brannon, "Teacher Commentary on Student Writing: The State of the Art," *Freshman English News*, 10 (Fall, 1981), 1-3.

2. For an extended discussion of revision strategies of student writers see Nancy Sommers, "Revision Strategies of Student Writers and Experienced Adult Writers," *College Composition and Communication*, 31 (December, 1980), 378-388.

3. Nancy Sommers and Ronald Schleifer, "Means and Ends: Some Assumptions of Student Writers," *Composition and Teaching*, 2 (December, 1980), 69-76.

4. Janet Emig and Robert P. Parker, Jr., "Responding to Student Writing: Building a Theory of the Evaluating Process," unpublished papers, Rutgers University.

5. For an extended discussion of this problem see Joseph Williams, "The Phenomenology of Error," *College Composition and Communication*, 32 (May, 1981), 152-168.

6. Ann Berthoff, *The Making of Meaning* (Montclair, NJ: Boynton/Cook Publishers, 1981).

7. W. U. McDonald, "The Revising Process and the Marking of Student Papers," *College Composition and Communication*, 24 (May, 1978), 167-170.

Until I See What I Say: Teaching Writing in All Disciplines

Until I See What I Say: Teaching Writing in All Disciplines, a book by Karen Burke LeFevre and Mary Jane Dickerson, has been published by the University of Vermont. This book offers suggestions to teachers in all disciplines who want to teach writing well, without becoming overburdened by paper work.

The book discusses reasons for teaching writing; ways for students to practice writing; ways for teachers to make assignments; and methods for generating ideas, revising prose, and responding to writing. The concluding chapter describes two models of the writing process, and the appendices give examples of writing assignments from courses in chemistry, education, composition, and literature.

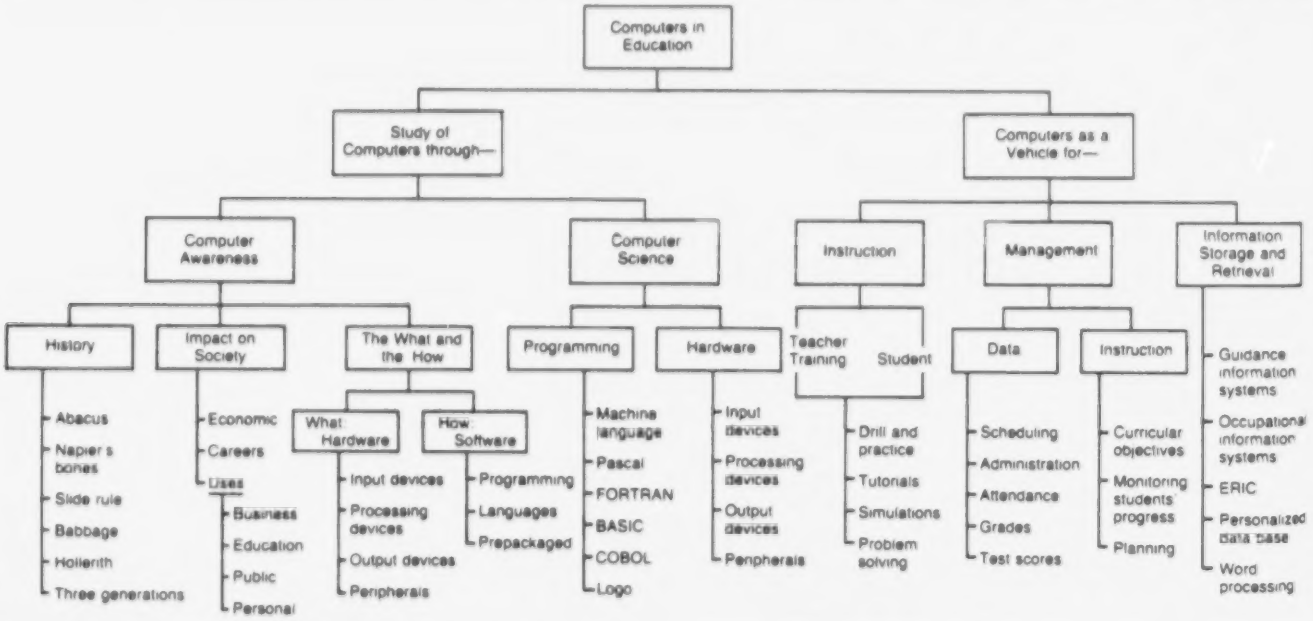
A limited number of copies of this 208-page book (indexed; 1981) are available. To order, send a check or money order for $13.00, made out to the University of Vermont, to Alton Roberts, Managing Editor, IDC Publications, 589 Main Street, University of Vermont, Burlington, VT 05405.

FROM: Arithmetic Teacher, December, 1983

Computers in Education

By **Karen A. Schultz** *and* **Lynn C. Hart**

Table 1 An overview of microcomputers in education



Note: Although the two halves of this chart are visually balanced, in reality the areas they represent do not receive equal emphasis.

In our endeavors to provide quality education, we are constantly trying to stay abreast of techniques and technology appropriate for the classroom. The computer has moved into education at all levels, bombarding us with a new jargon—hardware, software, CMI, CAI, bits and bytes, and CPUs and CRTs. One thing that helps is getting a handle on how computers fit into the educational picture.

The purpose of this article is to give a descriptive overview of computers in education. Two major components are (1) the computer as the object *of* instruction and (2) the computer used *for* instruction (as well as other uses). Although table 1 suggests a dichotomy with equal emphasis on the two components, in reality the two components are integrated as well as unequally represented in use.

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The Computer as the Object of Instruction

Two approaches can be used for studying the computer. The first approach, often referred to as *computer awareness* or *computer literacy*, has learning objectives such as the history of the computer, the impact the computer is making on society, and what the computer is and how it works. The second approach involves courses in computer science addressing the technical skills of programming and knowledge of the hardware. In both cases the computer is the *subject* of instruction.

Computer awareness

Depending on your educational philosophy and instructional objectives and strategies, computer literacy will

have a unique meaning for you. The words *computer awareness* suggest only a possible list of categories for instruction. A knowledge of computer awareness is not a prerequisite for computer science per se, and teaching it does not require much technical training by the classroom teacher. It is suitable material for the elementary and middle school classrooms.

- *History*. Students are frequently asked to trace the historical development of the computer. They study the development of crude calculating and computing techniques and machines (e.g., abaci and Napier's bones), the people who paved the way to the present-day computer (e.g., Hollerith, Babbage), and the generations of computers from vacuum tubes to chips.
- *Impact on society*. The second topic is the impact of the computer on society. Students study the economic influence in the form of jobs created and lost, time saved, and so on. They look at career opportunities in the field and observe the many uses of computers in business, education, and personal and public use.
- *The what and the how*. Finally, courses in computer awareness might include a basic introduction to computer hardware—input devices, processing devices, and output devices, and peripherals—and how a computer is made to operate using programs written in computer languages (software), some of which are prepackaged and some written by the students themselves.

Computer science

Computer science courses are usually suitable for the secondary, college, and technical school classrooms. They are very technically oriented and cover two main objectives:

- *Programming languages*. A program is a systematic list of instructions written in a special language and interpreted by the computer for the purpose of solving a problem. Instruction in this area teaches the student how to write programs in any of several languages, such as Pascal, BASIC, FORTRAN, COBOL, and Logo.
- *Hardware*. In this area students study the components of the computer (input devices, processing devices, output devices, and the peripherals mentioned earlier), as well as their repair and maintenance.

The Computer as a Vehicle for Instruction

The second major approach to the computer in education is using the computer for the purposes it was intended. It is not necessary to have studied the computer in depth in order to use it.

Instruction

One applied use is found in instruction, often referred to as *computer-assisted instruction* (CAI). Computers are used to provide instruction in various subject areas to both students and teachers. The most commonly found format for using the computer in the classroom is a *drill-and-practice* program in which the user practices a skill on the computer. Other less prevalent modes include tutorials, in which the computer actually teaches a new concept; simulations, in which students simulate some real-life situation; demonstrations, in which students graph data, functions, and approximations of area using the computer as a chalkboard; and problem solving, in which students use the computer as a tool for problem solving.

Management

Computers have been used for some time in educational settings to manage large quantities of data. Some uses might include such administrative areas as budget, payroll, inventory, and personnel and such student-related areas as scheduling, attendance, grades, tests, and total information systems (in which computers are used to maintain current and longitudinal information on students). The other major application of the computer in management is in instruction, the computer increasingly being used to monitor and evaluate students' progress in conjunction with curriculum objectives (computer-managed instruction, or CMI). The results are used to plan future instructional needs.

Information storage and retrieval

The computer is recognized as an efficient and practical system for storing and retrieving large quantities of information. It serves as a source for data on occupations as well as for maintaining research documents like ERIC and storing personal data. More recently, its word-processing capacity has been found to be significant.

Conclusion

We do not claim that table 1 is all-encompassing. We have organized it so that educators can get a clearer perspective of the field. In the end we can only hope to learn how to use the computer in the most productive and efficient manner possible so that it can serve our goal of quality education.

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